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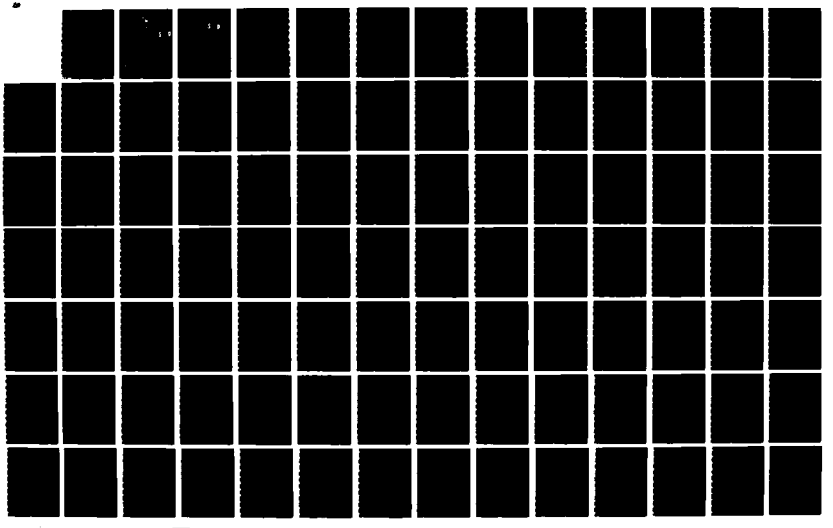

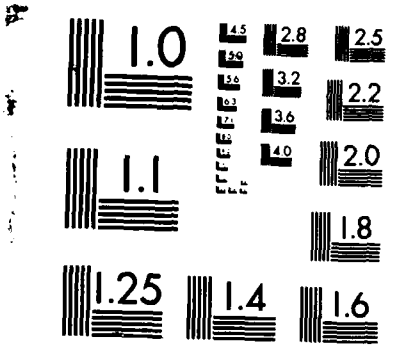

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AN ASSESSMENT OF WORK GROUP COHESION AND PRODUCTIVITY

THESIS

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Captain, USAF

AFIT/GLM/LSB/86S-78

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AN ASSESSMENT OF WORK GROUP COHESION AND PRODUCTIVITY

THESIS

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— Brian S. Smith

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Abstract

This ~~research~~ investigated the relationship of cohesion and productivity among work groups. The study was accomplished in two phases. First, the study investigated the strength of the relationship between cohesion and several variables that the literature reviewed as being strongly related with group cohesion. The strength of association that these variables had with cohesion was tested using a sample of employees from a military supply squadron. Secondly, the research studied the relationship between group cohesion and work group performance through employee and supervisory perceptions of group productivity and through the collection of actual productivity measures.

The variables that were significantly related to group cohesion were interdependence, communication, supervisor influence, participation in goal setting, rewards, and employee perceptions of group performance at the $p < .001$ level. The development of a cohesion scale resulted in observed significant differences between low and high cohesive groups in supervisor influence, participation in goal setting, and employee perceptions of group productivity. The supervisors' evaluation of group productivity did not support the hypothesis that group cohesion is positively related to group productivity. The

actual productivity measures showed a weak association with group cohesion, but the lack of statistical evidence of this relationship precluded any support for the notion that group cohesion is related to group productivity. Several implications of the research to military and civilian managers were explained and recommendations were made for further investigation of cohesion/productivity relationships.

AN ASSESSMENT OF WORK GROUP COHESION AND PRODUCTIVITY

I. Introduction

Research Issue

The general issue of this research is the relationship between cohesion and productivity in primary work groups. Cohesion "represents feelings of belonging" and "solidarity with a specifiable set of others" (Ingraham and Manning, 1981:6). Cohesion is commonly referred to as "group morale" in numerous organizations (Johns and others, 1984). Essential to cohesion is the interpersonal attraction of group members (Lott and Lott, 1965:259). Productivity in this research is defined as the level of job performance achieved by a work group when measured against supervisory standards or organizational standards. Primary work groups are defined in this research as predominantly small groups that operate on a face-to-face basis in a work environment.

The importance of groups is widely recognized. Groups form the basis for organizational life in our society (Jewell and Reitz, 1981:2). Many organizations maintain work groups to increase the effectiveness and efficiency of their operations. These work groups have a considerable influence on the success or failure of the organization.

The military relies predominantly on groups to accomplish its mission. As Colonel Francis Kish stated,

> Primary groups operate to impose standards of behavior (in garrison life and in combat) and to interpret the demands of military authority for the individual soldier. (Kish, 1982:10)

The primary group has been addressed as the solution to combat success and "the key element in organizational effectiveness" (Johns and others, 1984:30).

Cohesion is a factor that appears to greatly affect the performance of a group during war. Dupuy and Hammerman conducted a review concerning military studies of combat from the early 16th century to the 1973 Arab-Israeli War. One of their main findings was that cohesion is crucial to combat success (Dupuy and Hammerman, 1980). Marshall, in his study of American soldiers in World War II, concluded that cohesive groups were able to successfully fight despite the terror of modern war (Marshall, 1947).

The Department of Defense has recently placed increased emphasis on cohesion to increase the psychological readiness and performance of their personnel. The U.S. Army has established various programs to generate cohesion as a means of increasing performance. The Industrial College of the Armed Forces in 1984 dedicated their second volume in the Mobilization and Defense Management series to the study of cohesion (Johns and others, 1984). They concluded "that cohesion in the US military needs significant improvement" (Johns and others, 1984:viii).

While various authors have promoted cohesion as a means to improve combat performance, there has been little investigation as to whether group cohesion is related to productivity among logistics work groups in the Department of Defense. What is particularly surprising is that only one study of cohesion and productivity has been performed on logistic support organizations in the Department of Defense. In fact, this one study was performed well over thirty years ago (Strupp and Hausman, 1953)! Work groups in support organizations have been ignored despite evidence that history has shown logistics to be a deciding factor in the outcome of many battles. Napoleon, Patton, and Bradley are just a few of the great military leaders who have been affected by logistics support. Martin Van Creveld, an expert in current military strategy, stated that "logistics make up as much as nine tenths of the busness of war" (Van Creveld, 1977:231).

If cohesion is a major contributor to performance, as suggested by the literature review, it is only appropriate that cohesion be studied in relation to the productivity of work groups in the Department of Defense. Military managers are continually seeking ways to enhance their "people productivity." More cohesive groups should result in both improved co-worker relationships during peacetime and improved logistics support during wartime.

This research has particular significance because it it an actual evaluation of a large midwestern Air Force base support squadron and is a "real life" assessment of the value of cohesion in promoting more effective work groups. This research differs from the many studies of cohesion which have been performed in a controlled environment, or "vacuum."

Research Objective

This research has a two-fold purpose. The literature suggests several variables are highly related to work group cohesion. The first portion of this research will investigate the degree to which these previously identified variables are relevant to this study. Secondly, the research will investigate the linkage between group cohesion and productivity.

To accomplish these objectives, several aspects of cohesion and productivity will be investigated. First, the current literature regarding group cohesion will be reviewed. Secondly, a military logistics support squadron will be surveyed to obtain information on the relevant variables that influence cohesion. The survey will also investigate the relationship between group cohesion and perceived group productivity. Finally, supervisory perceptions of the work groups' productivity and actual productivity measures of the work groups will be obtained. These

measures will permit analysis of the relationship between group cohesion and productivity.

Summary

Little research has been accomplished in the identification of variables that influence cohesion in military logistics support work groups. This research should assist military managers in identifying what variables promote group cohesion and to what degree group cohesion is related to work group productivity. Chapter II provides both a review of the literature regarding the variables related to group cohesion and includes reviews of three studies that investigate the relationship between cohesion and productivity in work groups. The chapter concludes with the investigative questions and hypotheses that were developed for this study.

II. Literature Review

Introduction

Group cohesion, as defined in Chapter I, involves a sense of solidarity among the members of a group. Many times in the military, group cohesion is referred to as "morale." In order to avoid confusion, the meaning of morale in this research is synonymous with cohesion.

Group cohesion is not a new concept to the military. Napoleon allegedly said that success on the battlefield is highly dependent on the morale of the forces (Johns and others, 1984:1). Over a hundred years ago, a well-known military theorist named Ardant DuPicq tried to convince his Chief-of-Staff of the powerful influence of cohesion. DuPicq stated:

> Four brave men who do not know each other will not dare attack a lion. Four less brave, but knowing each other well, sure of their reliability and consequently of mutual aid, will attack resolutely. (Ingraham and Manning, 1984:1)

Ingraham and Manning stated that "Cohesion's importance in the history of war is so obvious and documented it would seem military commanders would think of little else, but maintenance, training and morale" (Ingraham and Manning, 1981:4). Napoleon's, Dupicq's, and Ingraham and Manning's comments testify to the importance of cohesive relationships among soldiers in battle.

Cohesion has important implications for both military and civilian organizations. In order to more clearly specify the impact of cohesion on the behavior of work groups, the review of current literature regarding the topic is presented in two parts.

The first portion of the review describes specific variables that appear to be the most relevant in assessing cohesion among the participating work groups in this research. These variables are discussed in three parts. First, a definition of the variable is provided which is relevant to this research. Secondly, a logical explanation is provided as to how the variable influences group cohesion. Finally, a review of relevant literature on the variable is provided that supports the variables' inclusion in this research.

Following the discussion of the variables that are associated with cohesion, three previous cohesion studies are reviewed. These studies focus on the linkage between group cohesion and group productivity.

The review of the current literature clearly indicated that further study of cohesion was required to better understand this complex topic. The specific issues that are addressed in this research are presented in the final section of this chapter as investigative questions and research hypotheses.

Factors Contributing to Cohesion

There are numerous factors in the work group that influence employees' attitudes and the cohesiveness of the work group. The literature has specifically identified eight variables that appear to have a strong influence on group cohesion. The first of these variables is the interdependence among employees' jobs in the work group.

Interdependence. In this research, interdependence is defined as "the connectedness between jobs such that performance of one depends on the successful performance of the other" (Kiggundu, 1983:146). In many organizations, the amount of interdependence among workers' jobs will be different in various groups. Employees in one group may be required to work side-by-side to accomplish their jobs which may facilitate the development of friendships with fellow workers. Other groups may contain job positions which do not require that employees interact to accomplish their work. These employees may be less likely to associate with fellow workers than the previously discussed group. The result may be less interaction, communication, and the ability to solidify group identity. One might expect then, that the cohesiveness of a group may be greatly influenced by the interdependence among its workers. The following review discusses the relationship between interdependence and group cohesion.

Thomas, in his research of interdependence among workers in a large private utility, stated that

> . . . when interdependence is high rather than low, members seem to be more attracted to the group, to strive harder to achieve their goals, and to be more responsive to their fellows. (Thomas, 1957:347)

The literature indicates that one of the most significant effects of high interdependence is the favorable degree of interaction among members of the group.

Jewell and Reitz stated that the interdependence among workers is very important because it enhances workers' interaction and facilitates communication within the group (Jewell and Reitz, 1981:27). Ingraham and Manning stated that "the first precondition for cohesion is opportunities for interaction" (Ingraham and Manning, 1981:8). Additionally, Ingraham and Manning (1981:8) suggested that cohesion was a property of a group that resulted from formal and informal interactions among members of that group. Gullahorn (1952) studied the interaction of clerical workers in a large organization. Gullahorn's findings suggested that the physical distance between employees was a major determinant of their interaction. Further, he reported that the degree to which employees worked physically close together had a positive affect on their frequency of interaction which, in turn, facilitated the forming of friendships.

Deep, Bass, and Vaughan studied the relationship between the ease with which group members were able to contact one another and group cohesiveness among graduate students at the University of Pittsburgh (Deep and others, 1967). Ninety-three graduate students were formed into nine work groups to perform business decision making. As a result of their study, Deep and others (1967:430) reported that the ease with which group members were able to contact each other was significantly correlated ($p < .01$) with group cohesion.

The literature strongly suggests that the interdependence of jobs in the workplace influences the interaction of employees. The interaction of employees appears to affect the cohesiveness of the work group. Therefore, the interdependence among work jobs in the work group may affect the cohesion level of the group.

The essence of cohesion is that people in the work group are attracted to one another in some manner. However, one may expect that certain influences from outside the immediate work group could affect these relationships. The following discussion of supervision indicates that supervisors may have a significant affect on the cohesiveness of work groups.

Supervisor Influence. In this research, supervisor influence refers to the ability of supervisors to affect

their work groups. Supervisor influence is related to the affect that a supervisor may have on a group due to his, or her, leadership position.

The fact that supervisors may affect group cohesion makes intuitive sense when one considers the impact a supervisor can have on a group. In the work setting, supervisors are most likely to have the greatest influence over the groups' behavior (Braun, 1983:37). A review of the literature suggests that the supervisor may affect group cohesion.

Johns and others, in their review of military cohesion, referred to leadership as "the critical element in cohesion" (Johns and others, 1984:31). Greene and Schriesheim felt that there was a two-fold reason for "refocusing research" on leadership (Greene and Schriesheim, 1980:50). First, they reviewed numerous studies and found cohesion to have a powerful influence on performance. Secondly, various studies have shown leadership to strongly affect cohesion.

Greene and Schriesheim conducted a longitudinal field investigation of the relationship between supportive leadership and group cohesion among 123 work groups. Supportive leadership refers to the leaders' ability to be approachable and considerate to the individuals of a group (House and Dessler, 1974). Greene and Schriesheim found that supportive leadership was positively related to group

cohesiveness at the $p < .01$ level in small groups and to a lesser extent in large groups. House stated that supervisory concern for employees can result in "social support, friendliness among group members, and thus increased cohesiveness and team effort" (House, 1971:325). Yukl stated that if leader-subordinate relationships are poor, subordinates may "withdraw from the job by quitting, being absent frequently, or escaping with alcohol or drugs" (Yukl, 1981:155). The implications for employee behavior in any of these situations described by Yukl may have negative affects on group cohesion.

Another aspect of leadership that appears to influence the cohesiveness of the group is the credibility of the supervisor. Braun referred to supervisor credibility as

> . . . the similarity between the groups perceived actual supervisor characteristics . . . as compared with the groups perceived appropriate supervisor characteristics under the groups operational conditions. (Braun, 1983:37)

Yukl stated that if a serious "credibility gap" exists between the supervisor and his subordinates due to poor supervisory advice or subordinates' lack of trust in the supervisor, the result will be the loss of supervisor credibility. Braun stated that if the supervisor loses credibility with employees, then various informal leaders of the group may evolve who fragment the established norms

of the group (Braun, 1983:38). If the group norms are disrupted, the result may be a less cohesive work group.

The supervisors' treatment of employees and the supervisors' credibility with employees are variables which appear to influence the cohesion of work groups. Therefore, these variables form the basis for the study of supervisor influence in this research.

The degree to which employees participate in goal setting also may affect the cohesiveness of the work group. Involving employees in goal setting has been shown to have numerous favorable effects which are described in the following discussion.

Participation in Goal Setting. In this research, participation in goal setting refers to the degree of involvement that group members have in establishing objectives for their particular work group. Participation in goal setting may increase employees' interest in their work and provide employees with a sense of belonging in the group. The ability of work members to discuss their ideas and aspirations with management would logically increase employee involvement and commitment to the work group. Therefore, the result of group members' participation in goal setting may be increased communication and cohesion within the work group.

There are numerous researchers who advocate the use of participative goal setting. Chaney and Teel stated that

> When employees have a piece of the action, they identify more closely with the company; they develop greater espirit de corps; and perhaps most important, they work harder to achieve goals they have helped to establish. (Chaney and Teel, 1977:166)

Locke and Latham (1984) stated that participation in goal setting increases employees' understanding of task requirements. Davis (1981:161) stated that participation in goal setting tends to improve employee motivation because group members feel more accepted and involved in their work situation. Davis also stated that employee participation can often result in better communication between employees and "reduced conflict and stress, more commitment to goals, and better acceptance of change" (Davis, 1981:161).

Chaney and Teel (1977) conducted a study of participative goal setting among two work groups in an electronics inspection department. The supervisors of the individual groups met with their employees and encouraged the employees to establish goals in an attempt to reduce paperwork errors. One of the supervisors met with his employees on an individual basis for short conferences during a four-week period. The other supervisor met with his employees jointly for one hour a week during the four-week period. Both groups established an objective of reducing the number of errors in paperwork by 50 percent. However, the group that established goals on an individual basis showed no

significant improvement while the group that jointly established goals reduced the number of paperwork errors by 75 percent. This finding suggests that employees in the participative goal-setting group may have had a better acceptance of the new goals because they mutually discussed their work problems, became more knowledgeable about the problems, and increased their motivation as a "team" to reduce the number of paperwork errors.

The literature on participation in goal setting clearly indicates that the joint establishment of goals by employees may result in increased communication and a favorable atmosphere to promote group cohesion. The importance of employee participation in goal setting is recognized by, and relevant to, this research effort.

The literature indicates that group size may be one of the most important moderating variables affecting group cohesion. The size of the work group may influence the other independent variables that affect group cohesion. Following is a discussion of group size.

Group Size. Group size is defined in this research as the number of members in the immediate work group. The size of a group may have a moderating influence on those variables that affect cohesion (Cartwright and Zander, 1968). If group size has an influence on the variables that influence cohesion, then the study of group size is applicable

to this particular research. The following review describes the influence of group size on the attitudes and behavior of work groups.

Viteles, in his research of organizational units, concluded that "The size of the work group affects output and attitudes, which both tend to be better in small sized groups" (Viteles, 1953:146). Porter and Lawler (1965) reviewed numerous studies within large organizations and consistently found that the size of the work group influences attitudes and performance. They found that smaller work groups had lower absence rates, turnover rates, accident rates, and fewer labor disputes while generally having higher productivity (Porter and Lawler, 1965:39).

Indik's review of ninety-six organizations indicated that larger groups have more difficulty in communicating (Indik, 1965). The literature clearly shows that the degree of communication among members of a group has a positive influence on cohesion in that work group. Hare, in his research of small groups, says that the group's ability to develop and stabilize is hindered as group size increases (Hare, 1976).

While much of the literature concerning group size reports that cohesion is more easily promoted in smaller groups, there is evidence that suggests group size does not affect group cohesion. Greene and Schriesheim (1980) examined the affect of instrumental leadership on large

groups containing sixteen to thirty-four members. Greene and Schriesheim (1980:50) defined instrumental leadership as task-oriented behavior which was oriented towards clarifying subordinates' roles. They reported that instrumental leadership and cohesion were significantly related in large groups at the $p < .01$ level.

Seashore (1954) studied the relationship between group size and the cohesiveness of work groups in an industrial setting. Seashore categorized work groups, according to their responses to a questionnaire, on a seven-point cohesion scale from low to high. He reported that the relationship between increasing group size and group cohesion was negative; however, the results were significant at the $p < .15$ level only and smaller groups oscillated between low and high cohesion. While far more evidence supports the notion that increasing group size has a negative affect on group cohesion, there have been findings to suggest group size may not be a strong moderating variable of group cohesion. This study will provide additional research into the relationship of the size of the group and the group's cohesiveness.

Another variable that the literature often cites as being important to group cohesion is the degree to which group members are similar. A review of the research on similarities follows.

Similarities. In this research, similarities refers to the degree that group members share common characteristics, interests, and attitudes. Work groups are composed of individual employees and each of these individuals has unique characteristics. To the extent that these individuals have similar interests or other characteristics, then there may be a basis for a common bond or attitude within the group. There is some evidence that similarities among members of a group increase cohesion.

Braun, in his study of U.S. Army units, stated that "The more similar the individuals in a group are in terms of age, geographic origin, education, culture, experiences, etc., the more likely strong group norms will develop" (Braun, 1983:33). Terborg, Castor, and Dennino conducted an analysis of forty-two groups of three or four persons to study the relationship of attitude similarities and cohesion (Terborg and others, 1976). The results of their longitudinal field experiment indicated that groups having members with similar attitudes can, over time, develop greater cohesiveness than groups whose members have dissimilar attitudes. Newcomb suggested that similarities among members in the work group was the biggest factor in promoting cohesion (Newcomb, 1963). Janowitz stated that "similarities in previous social experience such as social class, regional origin, or age supply a meaningful basis for responding to military life" (Janowitz, 1965:80).

Despite the evidence that similarities among employees promotes group cohesion, Seashore found no relation between group cohesiveness and homogeneity of age, or educational level, in industrial work groups (Seashore, 1954). Cartwright and Zander, in their review of studies relating similarities and group cohesion, stated that dissimilarities may sometimes be a source of attraction (Cartwright and Zander, 1968:99).

While the literature provides persuasive evidence that "similarities" can enhance the cohesiveness of a group, the conflicting findings indicates that further research is required in this area. Therefore, the study of "similarities" is included in this research.

One of the most cited variables that may affect cohesion is the communication between members of the group. The importance of communication to cohesion is illustrated through the following review.

Communication. In this research, communication refers to the exchange of thoughts, feelings, or information between group members. Communication appears to be the basis for coordination between group members. According to Jewell and Reitz, communication in groups "provides for orientation, goal setting, the dispersal of information, the distribution of rewards, and the maintenance of member relations" (Jewell and Reitz, 1981:35). If

communication within the group influences the interrelationships of co-workers, then logically the cohesiveness of the group may be affected. The following researchers describe the relationship between communication and group cohesion.

Gibson, Ivancevich, and Donnelly, in their research of organizational processes, stated that "One of the necessary conditions for the existence of a cohesive group is that members interact and communicate with each other" (Gibson and others, 1973:267). Lott and Lott stated that cohesion can be achieved "in a relatively neutral atmosphere in which there are ample opportunities for verbal communication" (Lott and Lott, 1965:262).

Indik studied the relationship of communication and cohesion in three organizational settings. These three organizational sites included thirty-two package delivery organizations, thirty-six automobile sales dealership organizations, and twenty-eight educational-political organizations. The amount of communication in each of these organizations was measured by a range of questionnaire items such as "How free do you feel to discuss your personal problems with your immediate supervisor" (Indik, 1965:342)? Indik reported that communication was significantly related to group cohesion in each organization at the $p < .01$ level. This finding is consistent with

Phillips and Wood's contention that "Communication is the lifeblood of human relationships" (Phillips and Wood, 1983: 96).

The literature provides support for the notion that communication can affect the cohesiveness of a group. Therefore, the element of communication is included in this research.

One variable that appears to affect the cohesiveness of work members is the length of time in which these individuals have maintained their membership in the work group. A review of current literature demonstrates that work groups containing employees with long periods of membership may be more cohesive.

Work Group Tenure. Work group tenure, in this study, refers to the amount of time that employees have spent in their present work groups. One would expect that the more time employees spend together in a work group, the greater opportunities they have to interact and form personal relationships. Therefore, the degree to which employees stay in one work group may have an influence on group cohesion. Various researchers have examined the relationship between work group tenure and group cohesion.

Greene and Schriesheim conducted a longitudinal field investigation of leadership and cohesion in 123 work groups in four organizations with an emphasis on the

moderating affect of the recency of group formation. These organizations included an aircraft manufacturer, an electronics manufacturer, a private research and development laboratory, and a steel manufacturer (Greene and Schriesheim, 1980:52). The employees of these four organizations provided attitudinal responses to a questionnaire that measured, among other variables, group cohesion. Greene and Schriesheim reported, through statistical analysis of the responses, that group recency and group cohesion had a negative relationship, significant to $p < .05$.

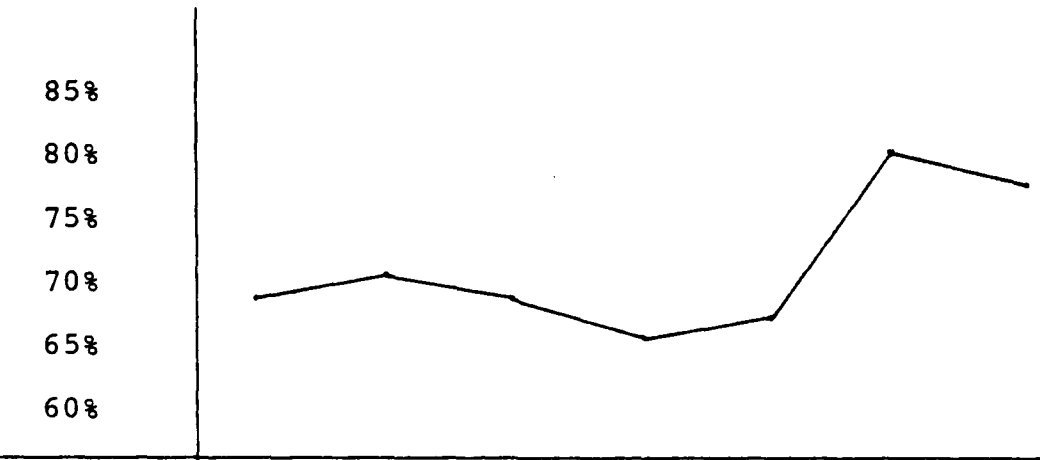
Deep, Bass, and Vaughan studied the relationship of familiarity and cohesiveness among graduate students at the University of Pittsburgh for a forty-five week period (Deep and others, 1967). Deep and his colleagues divided the ninety-three graduate students into different work groups, during the first thirty-week period, to provide students with various degrees of familiarity with fellow students. The groups were then consolidated, in the last fifteen-week period, into three different categories according to the students' degree of familiarity with fellow students. The researchers established one category with groups whose members trained together for the first fifteen weeks of the study. The second category consisted of groups which had one-half of their membership as students who had worked together previously. A third category contained work groups which had few students that had

previously worked together. Deep et al. reported that the first category, containing students who had previously worked together for fifteen weeks, rated themselves higher in cohesiveness than the other categories. The students in the first category also rated themselves higher in similar attitudes.

Seashore studied the effect of the length of group membership upon the cohesiveness of industrial work groups. Seashore measured cohesiveness through attitudinal questions of employees regarding their work groups. Seashore categorized groups (see Figure 2.1) according to their responses on a seven-point cohesion scale from low to high. He then compared low and high cohesive groups based on the percent of members who had over six months service on the job. Highly cohesive groups had a higher proportion of members with over six months service than did groups with low cohesion (Seashore, 1954).

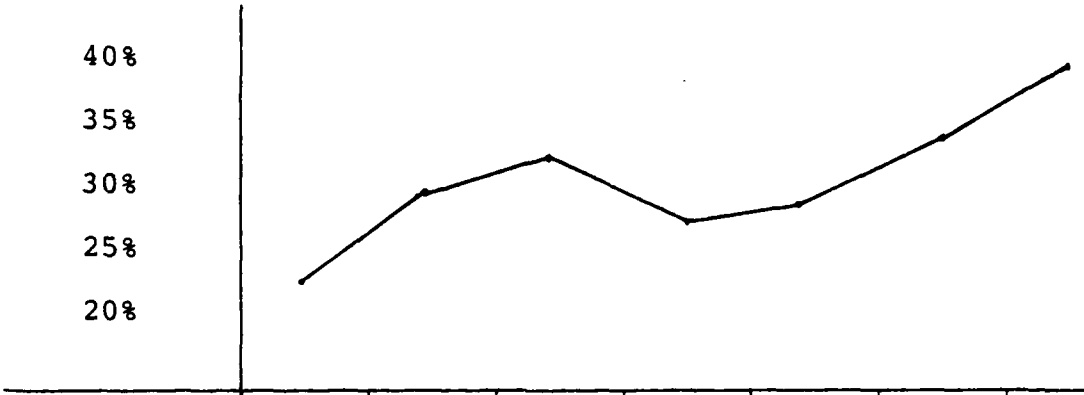
Seashore also compared (see Figure 2.2) high and low cohesive groups in relation to the percent of workers who had over three years of service. Highly cohesive groups had a much higher percentage of these workers. The relationship between length of service and group cohesion was significant at the $p < .001$ level.

These three studies (Greene and Schriesheim, 1980; Deep and others, 1967; Seashore, 1954) indicate that the length of membership of group members can affect the



Group Cohesiveness	1 (Low)	2	3	4	5	6	7 (High)
Number of Groups	7	16	52	65	57	19	12
Mean Percent of Members with Over Six months of Service	69.0	70.6	69.9	65.5	67.0	80.3	78.0

Fig. 2.1. Relationship Between Group Cohesiveness and Six Months of Service on the Job



Group Cohesiveness	1 (Low)	2	3	4	5	6	7 (High)
Number of Groups	7	16	52	65	57	19	12
Mean Percent of Members with Three Years of Service	22.2	29.4	32.1	27.5	28.2	32.9	39.2

Fig. 2.2. Relationship Between Group Cohesiveness and Three Years of Service on the Job

cohesiveness of a work group. Therefore, the study of length of membership is included in this research.

The satisfaction, or rewards, that people receive from being in a work group may also be important in the study of group cohesion. The current literature indicates that the rewards individuals attain in the work group may have a positive affect on group cohesion.

Rewards from Group Membership. In this study, rewards from group membership refers to employee satisfaction in two primary areas. First, rewards refer to the amount of respect that work members perceive they obtain from fellow workers. Secondly, rewards refer to an employee's perception that his, or her, job enables them to accomplish something they consider significant. The rewards that individuals obtain from being in work groups has a large influence on their attitudes toward the group and therefore the cohesion process. Jackson conducted an investigation among staff members of a child welfare agency. He found that the benefit people received from being within the group was highly correlated ($r = .61$) to the attraction they had for the other members in the group (Jackson, 1959:313). As Cartwright and Zander have stated the "attraction to the group depends . . . upon the expected value of the outcomes linked to membership" (Cartwright and Zander, 1968:96). Inherent in this

membership is the ability to be treated by co-workers in a manner consistent with expectancies and the ability of the group to fulfill expected goals. Lott and Lott have stated that

> . . . there is clear agreement among many . . . theorists that attraction will follow if one individual either directly provides another with reward or need satisfaction, is perceived as potentially able to do so, or is otherwise associated with such a state of affairs. (Lott and Lott, 1965:287)

The literature clearly indicates that the rewards people seek in the work group and their subsequent degree of obtaining these rewards, affects their perception of the work group. Therefore, the actions of the work member will be affected and, in turn, the cohesion of the work group.

Summary of Variables. While many variables can affect cohesion, those discussed in this portion of the literature review have demonstrated significant relationships with work group cohesion. A graphical presentation of these variables is provided in Figure 2.3. Now that support has been given for the independent or moderating variables that affect cohesion in work groups, a review of three previous studies of the linkage between work group cohesion and productivity is provided.

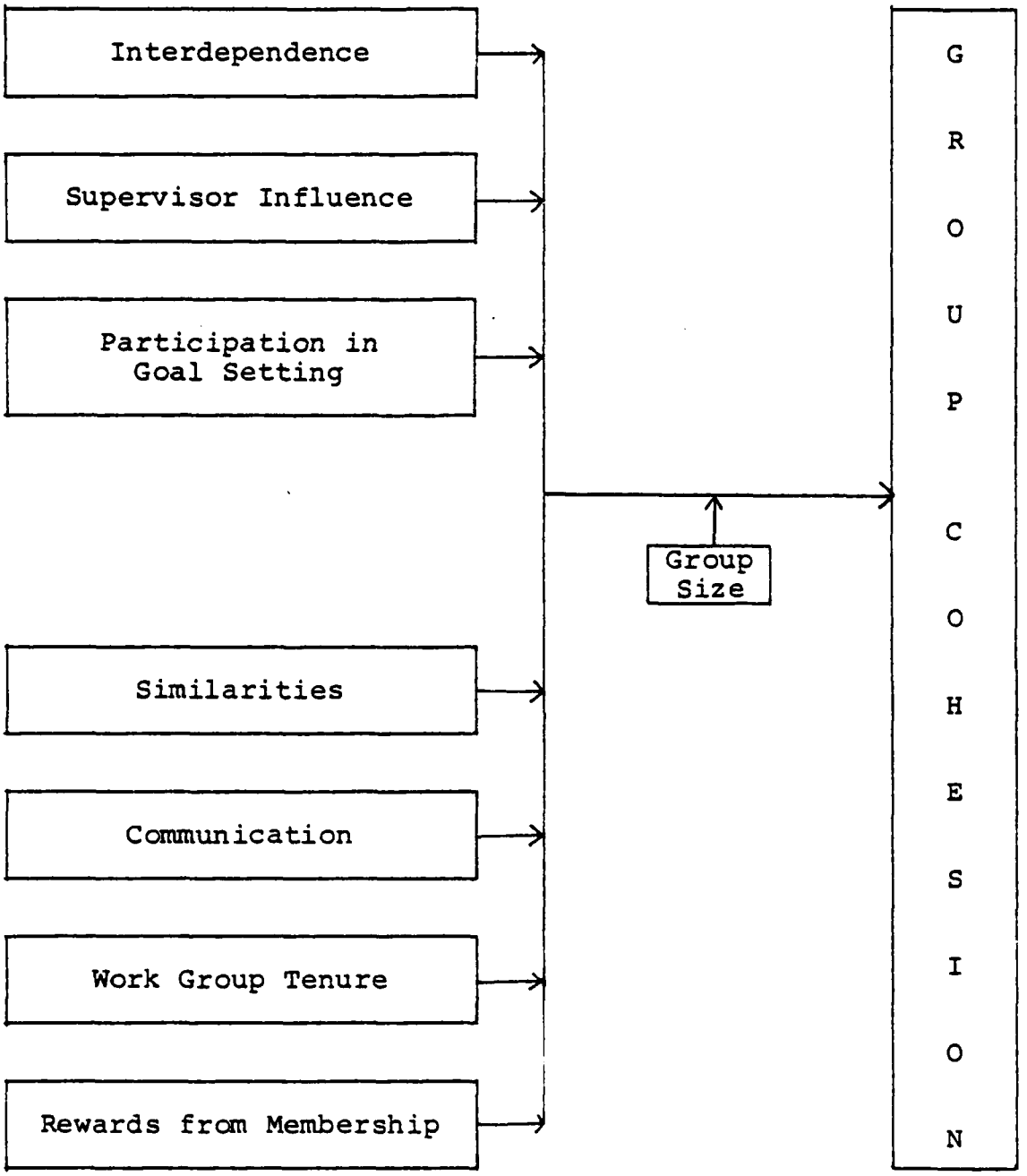


Fig. 2.3. Work Group Cohesion Model

Group Cohesion and Productivity

Research on the relationship of cohesion and productivity has been performed across various settings. Stogdill cited thirty-four major studies that had been accomplished in organizations ranging from basketball teams to combat crews (Stogdill, 1972:32). However, very few studies of cohesion and productivity have been performed in work groups. This review will focus on three studies in work groups that did attempt to assess the relationship of cohesion and productivity. These three studies also serve to illustrate the conflicting nature of findings relative to group cohesion and productivity.

Strupp and Hausman. Strupp and Hausman (1953) found a positive relationship between group cohesion and productivity among aircraft maintenance mechanics. Approximately one hundred maintenance mechanics and their supervisors were the subjects of the research. The maintenance workers were organized by particular task into nine crews. Each worker completed a questionnaire measuring job satisfaction, personal attraction and acceptance of group members, perceived equity in the organization, and acceptance of supervision. The supervisors were tasked to rate the job performance of each group member. Productivity was defined by having three management supervisors rank the crews from highest to lowest in performance.

Strupp and Hausman (1953) found that group morale, perception of the supervisor, and perceived productivity of the group were all highly correlated with the given definition of productivity. Supervisors' perception of their respective groups' performance was also very similar to how the three supervisors rank-ordered the groups' productivity.

These findings illustrate that highly cohesive groups tended to perceive themselves as more productive. Also, the supervisors evaluated their groups consistently with the work group members' perception of productivity. This study has particular significance to the author's research because it was conducted in a military logistics squadron. The findings suggest that increased group cohesion can result in improved group productivity. Unfortunately, there have been no other studies conducted in military support groups with which to compare these particular findings.

Horsfall and Arensberg. Horsfall and Arensberg (1949) found a negative relationship between group cohesion and productivity among four machine operator work groups in a shoe company. These work groups contained the same composition of skill levels, performed identical tasks, and were located next to each other. Though the work in this factor is much different from the work involved in

this research project, there are several similarities. Many of the people working in the shoe factory, like the present research, worked there for over three years. Also, workers were involved in the manufacturing of shoes and they used a production line which required great interdependence with fellow workers. A military supply organization similarly requires great interdependence among work group members to properly issue and distribute property.

Horsfall and Arensberg (1949) measured the social interaction of the workers through personal observation for a one-month period. Workers' interactions were recorded on observation charts in order to simplify and accurately report workers' activities. Horsfall and Arensberg stated that the observation of workers did not appear to bias the study. Productivity of the four work groups was measured by management's evaluation of the groups and by per-team measures of individual performance.

The results showed that teams which had the most interaction, through work requirements or personal conversation, were not the most productive. In fact, groups that had informal leaders as actual members of their "cliques" were less productive. One foreman concluded that people's ability to get along only hampered job accomplishment. In essence, group leadership had a huge influence on the groups' performance. As Horsfall and Arensberg stated,

the groups

> . . . vary in their own internal constitution as a function of personality differences, work flow and other factors, but they become most effective when they are directly under the control of a leader. (Horsfall and Arensberg, 1949:33)

Katz, Maccoby, and Morse. Katz, Maccoby, and Morse (1950) found no conclusive relationship between group cohesion and productivity among work groups in an insurance company. The work groups consisted of from ten to twenty-five people. Eighty-two percent of the non-supervisory employees in the study were women, 71 percent were not married, and 46 percent were between the ages of seventeen and twenty-four. Eleven percent of the employees had been employed there between two and five years, 37 percent had been with the company between five years and twenty years, and 25 percent of the employees had been with the company more than twenty years.

Katz, Maccoby, and Morse (1950) measured employee morale within work groups, employee perceptions of group productivity, and supervisor attitudes and practices concerning productivity. Group cohesion was defined as a function of the job itself, the work group, and the company as a social network. Productivity was defined by a comparison of the actual clerical time spent in accomplishing a task to an expected time period. This expected time period was based on historical records of the actual time

to accomplish the task. In essence, the number of man-hours distinguished between high and low productivity.

The work groups (sections) were chosen from two departments. These work groups performed similar tasks and therefore could be compared. Although productivity differences between work groups were often less than 10 percent, twelve "high-low" productivity pairs were chosen for comparison. The employees with these groups responded to "free answer interviews" on their work group, their jobs, the company and company policies, job status and salary, and supervision. Group cohesion was measured as a function of pride in the work group, intrinsic job satisfaction, company involvement, and financial and job status satisfaction.

Pride in the work group was defined as "the degree of feeling or attachment to the satisfaction with the accomplishment of the immediate or secondary work group of which the employee is a member" (Katz and others, 1950:39). This variable was measured by combining how members felt about their group as opposed to other groups and to what extent members identified with their groups. The employees in the low and high productivity sections were compared in terms of pride in the work group. T-tests showed that the high performance sections displayed a significantly greater sense of loyalty and pride than low productivity sections

at the $p < .05$ level. A comparison of the overall responses to group pride is provided in Table 2.1.

TABLE 2.1

RELATION OF EMPLOYEE PRIDE IN WORK GROUP TO PRODUCTIVITY

Work Group	High Pride	Medium Pride	Low Pride	N
Employees in High Sections	33%	37%	30%	143
Employees in Low Sections	10%	41%	49%	142

Intrinsic job satisfaction refers to the gratification obtained by employees in performing required job responsibilities. This measure of job satisfaction included how employees liked their work, their opportunities to use their abilities, their sense of accomplishment, and the jobs' overall importance to the individual. High and low productivity sections were compared by t-tests to determine if there was any difference in their realization of job satisfaction. The relationship of employee job satisfaction to section productivity was not significant at the $p < .05$ level. In fact, the sections with low productivity seemed to have more of an overall sense of intrinsic job satisfaction. A comparison of the overall responses to employee intrinsic job satisfaction is provided in Table 2.2.

TABLE 2.2

RELATION OF EMPLOYEE INTRINSIC JOB SATISFACTION TO SECTION PRODUCTIVITY

Work Group	High Intrinsic Job Satis-faction	Medium Intrinsic Job Satis-faction	Low Intrinsic Job Satis-faction	N
Employees in High Sections	26%	32%	41%	167
Employees in Low Sections	37%	25%	38%	161

Company involvement was defined as the extent to which the employee identified with and enjoyed working at the company. This measure was derived from questions asking about the fairness of the company, how well the employee liked working at the company, and to what extent the person identified with the company. High and low productivity sections were compared by t-tests to evaluate differences in their degree of company involvement. T-tests showed that the high performance sections did not significantly differ from the low productivity sections at the $p < .05$ level. A comparison of the overall responses to employee involvement in the company is provided in Table 2.3.

Financial and job status satisfaction was defined as "the degree of satisfaction the employee has with his present and expected earnings and with the status of his

TABLE 2.3

RELATION OF EMPLOYEE INVOLVEMENT IN COMPANY TO SECTION PRODUCTIVITY

Work Group	High Company Satis-faction	Average Company Satis-faction	Low Company Satis-faction	N
Employees in High Sections	37%	39%	24%	167
Employees in Low Sections	40%	40%	20%	161

present and expected position in the company" (Katz et al., 1950:44). This measure also included a measure of the degree that respondents were frustrated in their positions.

High and low productivity sections were compared by t-tests to evaluate differences in their financial and job status satisfaction. T-tests showed that the high performance sections did not significantly differ from the low productivity sections at the $p < .05$ level. A comparison of the overall responses to financial and job status satisfaction is provided in Table 2.4.

In summary, only one of the four variables that measured cohesion (pride in the work group) was positively related to productivity. Katz, Maccoby, and Morse (1950) concluded that supervision was primarily responsible for the differences between high and low producing work groups. Again, as in previously reviewed studies, the element of

TABLE 2.4

RELATION OF EMPLOYEE FINANCIAL AND JOB STATUS SATISFACTION TO SECTION PRODUCTIVITY

Work Group	High Satis-faction	Average Satis-faction	Low Satis-faction	N
Employees in High Sections	28%	39%	33%	177
Employees in Low Sections	24%	44%	32%	178

supervision is a major determinant of the morale and productivity of the group.

Summary of Studies. Three different studies of group cohesion and productivity in work groups were presented. These studies resulted in three different relationships. Strupp and Hausman (1953) found a positive relationship between group cohesion and productivity among aircraft mechanics. Horsfall and Arensberg (1949) found a negative relationship between group cohesion and productivity in a shoe company. Katz, Maccoby, and Morse (1950) found no conclusive relationship between group cohesion and productivity among work groups in an insurance company. The conflicting results are of themselves sufficient reason to investigate the relationship of cohesion and productivity.

Clearly, the combination of the reviewed variables that may affect group cohesion and the conflicting studies of cohesion and productivity suggest that additional research is required in this area. The approach taken in this research is reflected in the investigative questions and hypotheses in the following section.

Investigative Questions and Hypotheses

The literature review identified eight variables that appear to have a major affect on group cohesion. While this study will address all of these variables, the research will not specifically discuss three of these variables. These three variables are communication within the work group, the psychological rewards that employees obtain from being in a work group, and the interdependence among workers' jobs. These three variables will not be included in this investigation for the following reasons.

Communication is a well accepted "necessity" in the proper functioning of groups. Further research of this variable would probably not make a significant contribution to the body of knowledge that already exists on communication and cohesion in the work group. Similarly, studies of psychological rewards that people receive from participating in a work group have also repeatedly shown a strong relationship with group cohesion. Finally, the study of job interdependence in this research, would

require that greater evaluation be made of the linkage between employees' jobs in the squadron under study. Due to time constraints, this variable is deferred for future research.

Though these three variables are very important to group cohesion, the primary purpose of this research is to further investigate those variables that have shown ambiguous relationships to group cohesion. Additionally, the research seeks to evaluate variables that are specific to this particular sample site. Under these criteria, five variables were chosen for evaluation with work group cohesion. These variables include the supervisor's influence on the work group, employees' degree of participation in goal setting, size of the work group, similarities of the work group members, and the amount of time that employees have spent in their work group. The reason for the examination of each of these five variables follows.

The study of the supervisor's influence on the work group appears to be essential, because as Johns and others stated, leadership may be "the critical element in cohesion" (Johns and others, 1984:31). Braun also suggested that supervisors may have the greatest impact on group behavior. The supervisor's apparent ability to influence group cohesion and the opportunity in this research to collect information on work members' perception of their

supervisors is the basis for the inclusion of supervisory influence.

The second variable selected for study is the degree of employees' involvement in goal setting. The inclusion of employees in goal setting, as demonstrated by the literature review, may impact the cohesiveness of the group. However, the effects of employee participation in goal setting has been conducted primarily in civilian organizations. This research will examine employee participation in goal setting in a military environment.

Another variable that will be evaluated is the effect of group size on the cohesiveness of the group. The size of the work group, as noted in the literature review, has not consistently affected work groups in a similar manner. Additionally, Terborg and others (1976) stated that research on small groups has been largely confined to laboratory settings. The conflicting findings on the moderating affect of group size and the tendency to examine group size in a "closed environment," suggest that a field experiment in studying group size is warranted. Therefore, this research effort will examine the effect of group size on the cohesiveness of the work group.

The relationship between "similarities" of work group members and the cohesiveness of the group is another area that has been typified by conflicting evidence. Braun (1983) suggested that similarities in age assist in

establishing group identity, while Seashore (1954) reported that group member similarity of age in work groups was not significantly related to group cohesion. Cartwright and Zander (1968) reviewed numerous studies of similarities between group members and stated that dissimilarities may sometimes be a source of attraction. The investigation of the effect of similar characteristics among group members on the cohesion of work groups in this research may provide additional insight into this area.

The final area that will be investigated in this research is the length of time that members have stayed in their particular work groups. The relationship between work group tenure and group cohesion is particularly relevant to this research. The survey site under study contains work groups that vary in their distribution of military and civilian members. The military members are usually assigned to a squadron for three to four years. One might expect then, that groups which contain more military members would have less time and opportunity to build cohesive relationships. This area will be investigated by an analysis of work group tenure and the cohesion of group employees.

The approach taken in the investigation of the variables that influence group cohesion is reflected in Investigative Questions #1 and #2. The hypotheses associated with these two investigative questions assess the

impact that the five selected variables have on group cohesion. Investigative Questions #3 and #4, and their respective hypotheses, were formulated to further investigate the findings of the three studies evaluating group cohesion and productivity in work groups.

Investigative Question #1. What variables, relevant to work groups, and this study, affect cohesion?

Hypothesis 1.1. The favorable review of the group supervisor by the group members is positively related to group cohesion.

Hypothesis 1.2. Participation in goal setting is positively related to group cohesion.

Hypothesis 1.3. Group size is negatively related to group cohesion.

Investigative Question #2. How does the composition of the work group affect the cohesion level?

Hypothesis 2.1. Work groups that contain either predominately military members or civilian members have a higher cohesion level than those groups with a relative equal distribution of both civilian and military members.

Hypothesis 2.2. Work groups that are relatively uniform in age have a higher degree of group cohesion.

Hypothesis 2.3. Work groups that contain members with longer service in their present work groups are characterized by a higher degree of group cohesion.

Investigative Question #3. What relationship is there between group cohesion and how people view the performance of their work group?

Hypothesis 3.1. Group cohesion is positively related to perceived group productivity.

Investigative Question #4. How does group cohesion affect group performance?

Hypothesis 4.1. Group cohesion is positively related to group productivity.

Summary

The review of the current literature clearly indicates that further research into both the factors that influence cohesion and the relationship between group cohesion and productivity is needed. The following chapter will discuss the procedures used in this research to measure those variables expected to contribute to group cohesion and also then to assess the relationship between group cohesion and productivity.

III. Methodology

Overview

This chapter outlines the methodology used in the evaluation of the investigative questions and hypotheses stated in Chapter II. The first section addresses the process used in the selection of the survey population. The second section discusses the selection and development of the three data collection instruments used in this study. The third section describes the administration of two questionnaires used in this research as data collection instruments. The final section outlines statistical analysis of the research data.

Survey Population

Numerous military logistics support squadrons were considered as candidates for this research. A supply organization was selected as the test population because of the accessibility of numerous work groups and also because of the author's familiarity with Air Force supply productivity measures. The supply organization was also chosen because it has a mixture of civilian and military members composing the work groups. Work groups within the squadron had either predominately military or civilian members and others contained a relatively equal amount of

military and civilian members. This population diversity was expected to provide an interesting basis for comparing these work groups for cohesion and productivity.

Data Collection Instruments

The selection process for data collection instruments was driven by the hypotheses in Chapter II. Because these hypotheses required that a wide variety of information be obtained, three data collection instruments were chosen to evaluate these particular research areas.

The first data collection instrument used was an employee survey. This survey was designed to evaluate employee attitudes toward their work group. The other two data collection instruments, the Supervisor's Rating Form and work group productivity measures, were used together to assess the linkage between group cohesion and productivity. A discussion of each of the three data collection instruments follows.

Employee Survey. The first data instrument used was an employee survey. The employee survey (see Appendix C) consists of seventy items. An anonymous survey was preferred over other data collection methods in part because of the sensitive nature of this research. Another form of data collection, such as personal interviews, could have possibly induced bias into the research or threatened employees' security. In addition, the size of the sample

made a survey the most time-efficient device for collecting the type of information needed for this research.

The employee survey is especially useful because it was developed by combining existing surveys which had evaluated the different variables included in this research. The employee survey consists of items taken from Kiggundu's (1983:52) Task Interdependence Questionnaire, the Logistics Management Center Organizational Assessment Package (Waller, 1982), the Michigan Organizational Assessment Questionnaire (Seashore and others, 1983), and Braun's (1983) Individual Survey Questionnaire.

Supervisor's Rating Form. The Supervisor's Rating Form, a previously validated questionnaire used by the Organizational Behavior Department at the Air Force Institute of Technology, was one of the two methods used to evaluate productivity in work groups. The Supervisor's Rating Form (see Appendix D) is an anonymous appraisal of each work group member which the supervisor of the work group completes. This form of analysis enabled the researcher to collect supervisory perceptions of each respective work group member's performance. The Supervisor's Rating Form contains six questions pertaining to the performance of employees. The categories covered in these six questions included the supervisor's assessment of quantity of work, quality of work, efficiency of work,

problem-solving capacity, adaptability/flexibility, and overall effectiveness for each employee under his or her supervision. Calculating the average of the performance scores given to each employee in the group was one method of addressing the productivity of work groups. Another way to assess the performance of work groups was to obtain objective productivity measures for the groups under study. Collecting actual productivity measures was taken as a second method of evaluating work group productivity.

Work Group Productivity Measures. Numerous discussions were held with the supervisors of the various supply sections to identify and develop productivity measures for their respective work groups. Quantifiable productivity measures were sought which typified the work load of each group for the objective evaluation of the performance of each group. These measures were collected by the appropriate work group supervisor on a periodic basis for approximately three months.

The three-month data collection period allowed measurement of the group's performance in the month prior to the employee survey, the month of the employee survey, and the month after. The productivity measures were taken concurrently with the previously discussed measure of cohesion to facilitate investigation of the relationship between these two measures as part of this research.

Administration of Questionnaires

The employee surveys and the Supervisor's Rating Forms were administered during the same period of time to the research participants. First, the administration of the employee survey is discussed followed by a description of the procedures involved in administering the Supervisor's Rating Form.

Employee Survey. The employee survey was initially designed for administration to thirty-one work groups. These groups contain 343 employees, with 227 (66 percent) civilian members and 116 (34 percent) military members. The number of groups was eventually reduced to eighteen because of three reasons. First, certain work groups were not available to take the survey due to mission requirements. Secondly, management decided that some groups of employees ought to be consolidated since these small sections actually performed very interrelated work as if they were a single group.

Finally, work groups that had a sample size of less than five were disregarded due to their questionable validity. When samples are less than five, it is very difficult to infer with reasonable confidence that the sample is representative of the population under study (Banks and Carson, 1984). Therefore, a total of 244 employees, 174 civilian members (72 percent) and 70

military members (28 percent), were offered the opportunity to participate in the employee survey.

This author attended staff meetings of the various supply sections and discussed the contents of the employee survey with the work group supervisors. The work group supervisors were given employee surveys and optical scan sheets for each member of their work unit. The supervisors were informed that participation in the survey was voluntary and that anonymity was guaranteed for all participants. The supervisors were instructed to have their group members complete the survey by identifying their work code number (see Appendix C) on the optical scan sheet, answering the questions on the survey, transferring their answers to the optical scan sheet, and returning the survey and answer sheets to the supervisors sealed in envelopes that were provided. The completed employee surveys were returned to the author by work group supervisors the same day they were distributed.

Supervisor's Rating Form. The Supervisor's Rating Form was also discussed with the work group supervisors at the section staff meetings. Supervisors were informed that they would be evaluating the productivity of their work group members and that their own participation was voluntary. The supervisors were given a Supervisor's Rating Form for each person in the group and were instructed to

complete all six questions for each employee in the group. For each question, supervisors were asked to evaluate the performance of each member of the group in relation to the performance of the other members of the group who performed similar work. The group members were rated on a seven-point scale from "far worse" to "far better" than other employees. The supervisors were informed of the sensitivity of the rating forms and were instructed to not identify the individual employees. The supervisors returned these surveys to this author the same day they were distributed. Upon receipt of the responses, the answers were transferred from the Supervisor's Rating Forms to optical scan sheets.

Statistical Analysis

Statistical analyses were performed on the employee survey responses, Supervisor's Rating Form responses, and actual group productivity measures. A discussion of the particular methods used to evaluate each of these areas is discussed in the following three subsections.

Employee Survey. The optical scan sheets containing the responses to the employee survey were "read" into the Academic Support Computer (ASC) at the Air Force Institute of Technology. A statistical package was used to evaluate these employee responses. The examination of the data was divided into three phases.

First, comparisons were made with regard to the total number, and percentage, of civilian and military members in the sample as opposed to the total supply squadron. A comparison was then made of the number of civilian and military members surveyed in each work group versus the total number of civilian and military members in these groups.

Second, the independent variables reviewed in the first portion of Chapter II and the cohesion variable, were formulated by summing appropriate individual questions in the survey. The validity of these composite variables was then confirmed by the existence of statistically significant Pearson correlations between the composite variables and by the performance of a reliability analysis for each of these variables.

Finally, the average cohesion responses for each work group were examined. An analysis of variance was performed to determine if there were significant differences between the cohesion scores of the various work groups. Subsequently, a cohesion scale was developed by examining the range of the cohesion scores and consolidating the work groups into five categories of cohesion from low to high. T-tests were performed between the employee cohesion responses in each category to determine if there were significant differences between categories. The selection of the five cohesion categories provided the framework for

evaluating Investigative Questions #1, #2, and #3 and their respective hypotheses.

Supervisor's Rating Form. The optical scan sheets containing the responses to the Supervisor's Rating Forms were also "read" into the Academic Support Computer (ASC) at the Air Force Institute of Technology. The data were subsequently evaluated according to a three-step process. First, a reliability analysis was performed on the six questions involved in the performance appraisal. Secondly, the cohesion categories developed earlier were used to investigate the relationship between the group cohesion scores and the supervisors' ratings of employee productivity. The use of the Supervisor's Rating Form was one method used to examine the relationship between group cohesion and group productivity. Another method used to examine group productivity was the evaluation of work group productivity measures.

Work Group Productivity Measures. Work group productivity measures were the most difficult and potentially subjective part of the entire data collection process. The work groups were not compared against each other because of the different and unrelated responsibilities of each work group. Because a direct inter-group comparison of performance was not possible, the approach taken in this research was an intra-group comparison of work group productivity.

The productivity measures were collected at regular intervals beginning six weeks prior to, and continuing until six weeks after, the administration of the employee survey. When possible, the author tried to use historical data to provide comparisons. If this data was not available, trends were sought in the collected productivity measures that indicated the relative productivity of the group. The work groups were then classified as having either a decrease in productivity, no change in productivity, or an increase in productivity. The categorization of each group depended on how the group's productivity compared to the earlier measured period or by the author's personal analysis of the productivity of the group in the three-month period.

Summary

This chapter demonstrated the procedures used to evaluate the investigative questions and hypotheses stated in Chapter II. This study is in two parts. The first part concerns an evaluation of the independent variables that the literature suggests are strongly associated with cohesion. The second part investigates the relationship between cohesion and productivity in logistics support work groups. A better understanding of the linkage between group cohesion and productivity would be of great benefit to military and civilian managers who continually face the

challenge of being asked to "provide more with less." The following chapter provides a more detailed analysis of the relationships investigated in this research.

IV. Data Analysis and Discussion

Overview

This chapter contains the analysis and discussion of the areas outlined in Chapter III. Specifically, four areas of primary analysis are conducted. First, the sample survey and the population of the organization under study are compared to determine the degree to which the sample survey represented the population. Second, initial analysis of the data is performed to examine the potential differences among work groups in group cohesion. Third, a cohesion scale is established to measure the relationship between the independent and moderating variables and work group cohesion. Finally, the relationship between group cohesion and productivity is examined through employee perceptions of group productivity, supervisor perceptions of group productivity, and actual work group productivity measures.

Comparison of Population and Sample Elements

The demographics of the sample and the overall organization population were compared in order to verify that the sample is representative of the general population of the organization. Table 4.1 is a comparison of the distribution of military and civilian employees in both

TABLE 4.1

COMPARISON OF SURVEY RESPONDENTS
TO SQUADRON POPULATION

Service Category	Population	Sample
Military	116 (34%)	50 (27%)
Civilian	227 (66%)	136 (73%)

the supply organization and the sample. The data in Table 4.1 strongly suggests that the sample was representative of the squadron population in terms of the percentage of military and civilian employees.

A total of eighteen work groups were involved in the employee survey. Table 4.2 provides a comparison of these work groups by the number of military and civilian employees who participated in the survey. The figures in Table 4.2 demonstrate that the mixture of civilian and military members in the sample was almost identical (27 percent military and 73 percent civilian members) to the actual population of the groups (28 percent military and 72 percent civilian members). Though there was some variance within the groups, the sample appears overall to be representative of the eighteen groups.

Reliability of Composite Variables

The data in Table 4.3 (page 58) demonstrate that the eight composite variables exhibit acceptable reliability

TABLE 4.2

COMPARISON OF SURVEY RESPONDENTS TO POPULATION MEMBERS BY WORK GROUP

Work Group	Total Population		Sample Population	
	Military	Civilian	Military	Civilian
100	10	3	5	3
101	5	9	2	6
102	2	5	1	4
103	6	3	5	3
105	7	0	5	0
200	3	7	3	5
201	2	23	2	23
202	2	12	1	9
203	3	23	2	20
205	2	36	2	20
300	5	8	2	6
303	3	4	2	4
305	6	2	6	2
307	4	8	3	6
401	7	11	6	9
403	2	4	2	4
405	1	7	1	4
406	0	9	0	8
Total	70	174	50	136
	(28%)	(72%)	(27%)	(73%)

TABLE 4.3

RELIABILITY OF COMPOSITE VARIABLES

Composite Variable	Coefficient Alpha Level
Cohesion	.90
Interdependence	.69
Communication	.82
Supervisor Influence	.84
Participation in Goal Setting	.78
Rewards	.83
Group Performance	.88
Supervisor Evaluation of Group Productivity	.96

coefficients. The relatively high Pearson correlations among the individual items that make up the composite variables (see Appendix A) further indicates sufficient reliability for the eight composite variables.

Initial Data Analysis

An underlying premise of this study is that differences in the cohesiveness of work groups should exist. A highly reliable coefficient alpha of .9 for the cohesion variable suggests that any differences in cohesion between work groups are valid findings, rather than a result of employees' misinterpretation of the survey items. The first section of this initial data analysis demonstrates, through the use of a oneway anova, that the work groups

evaluated in this study do exhibit differences in cohesion scores.

Oneway Anova. The oneway anova (see Table 4.4) produced an F value of 3.0681, which is triple the value required for a significant difference between work groups at the $p < .01$ level. The high F value also suggested that there was a significant difference between work groups at the $p < .001$ level. Therefore, it was logical to construct a cohesion scale by separating those groups scoring high in cohesion from those with low cohesion scores.

TABLE 4.4

ANALYSIS OF VARIANCE OF COHESION

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	24	57.5273	2.3970	3.0681	.0000
Within Groups	175	136.7196	.7813		
Total	199	194.2469			

Development of the Cohesion Scale. A two-step process was used initially to differentiate among work groups based on the magnitude of their average cohesion scores. First, the average cohesion score was calculated for the eighteen work groups. This average was used as a standard to categorize the work groups. Secondly, one

standard deviation from this average was calculated to determine if any work groups were above or below this parameter.

The categorizations in Table 4.5 demonstrate that three groups were one standard deviation below the mean and were therefore classified as "low cohesion" groups. Three groups were one standard deviation above the mean and were classified as "high cohesion" groups. The other groups were considered as average in their cohesion score and classified as "medium cohesion" groups.

TABLE 4.5

INITIAL CLASSIFICATION OF COHESION SCORES

Low Cohesion	Medium Cohesion	High Cohesion
Group 101	Group 100	Group 102
205	103	200
307	105	202
	201	
	203	
	300	
	303	
	305	
	401	
	403	
	405	
	406	

This initial classification of work groups proved to be inadequate for analysis because of the large concentration of groups under the classification of "medium

cohesion." In order to provide a more diverse distribution of cohesion scores, a different methodology was used to place the eighteen work groups into five categories of cohesion (see Table 4.6)

TABLE 4.6

FINAL CLASSIFICATION OF WORK GROUPS
BY COHESION SCORE

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5
Low Cohesion	Low to Medium Cohesion	Medium Cohesion	Medium to High Cohesion	High Cohesion
(4.0 and below)	(4.1-4.4)	(4.5-4.8)	(4.9-5.2)	(5.3 plus)
Group 101	Group 100	Group 105	Group 201	Group 102
205	103	401	300	200
307	203		303	202
	305		405	
	403		406	

The five categories of cohesion were developed in a two-step process. First, the range of the scores (1.9) was divided by five. This resulted in a score of .38 which was rounded to .40. This value was used to construct five cohesion categories with equal intervals. Secondly, the eighteen work groups were then placed by their average group cohesion scores into the appropriate cohesion category from one (low cohesion) to five (high cohesion). The groups that were in the low and high cohesion categories in the initial classification of groups were also found to be

in the low and high cohesion categories in the final classification of work groups.

Admittedly, there is subjectivity in dividing the groups into the five classifications of cohesion. One could argue that there is virtually no difference between a group cohesion score of 5.1 (medium to high cohesion) and 5.3 (high cohesion) because on the employee survey scale (see Appendix C) they both are between "agree" and "strongly agree." However, the widening of the distribution did provide a more workable cohesion scale to compare work groups in this research. Seashore (1954) also used a similar methodology in differentiating among the cohesion scores of industrial work groups. Numerous t-tests were performed to ensure that there were differences between the various categories of group cohesion.

Validation of Cohesion Categories. The comparison of the cohesion categories (see Table 4.7) demonstrates strong support for the methodology used in categorizing the work groups according to their average cohesion score. Significant differences are evident between the five cohesion categories except for cohesion values of groups in Category 2 and those in Category 3.

These significant differences between cohesion categories provided evidence that the cohesion categorization scheme would be useful as the framework for comparing

TABLE 4.7

STUDENT'S T-TEST OF MEANS--POOLED VARIANCE ESTIMATES OF GROUP COHESION

Category	1 (LOW)	2 (LOW TO MED)	3 (MED)	4 (MED TO HIGH)	5 (HIGH)
1 (LOW)	-	*	*	***	***
2 (LOW TO MED)	*	-	N	***	***
3 (MED)	*	N	-	***	***
4 (MED TO HIGH)	***	***	*	-	**
5 (HIGH)	***	***	***	**	-

* $p < .05$
** $p < .01$
*** $p < .001$
N represents a nonsignificant t-test.

work groups in terms of (1) the independent variables that influence cohesion, (2) the relationship of cohesion to employee perceptions of performance, and (3) productivity measures.

Analysis of Independent and Moderating Variables

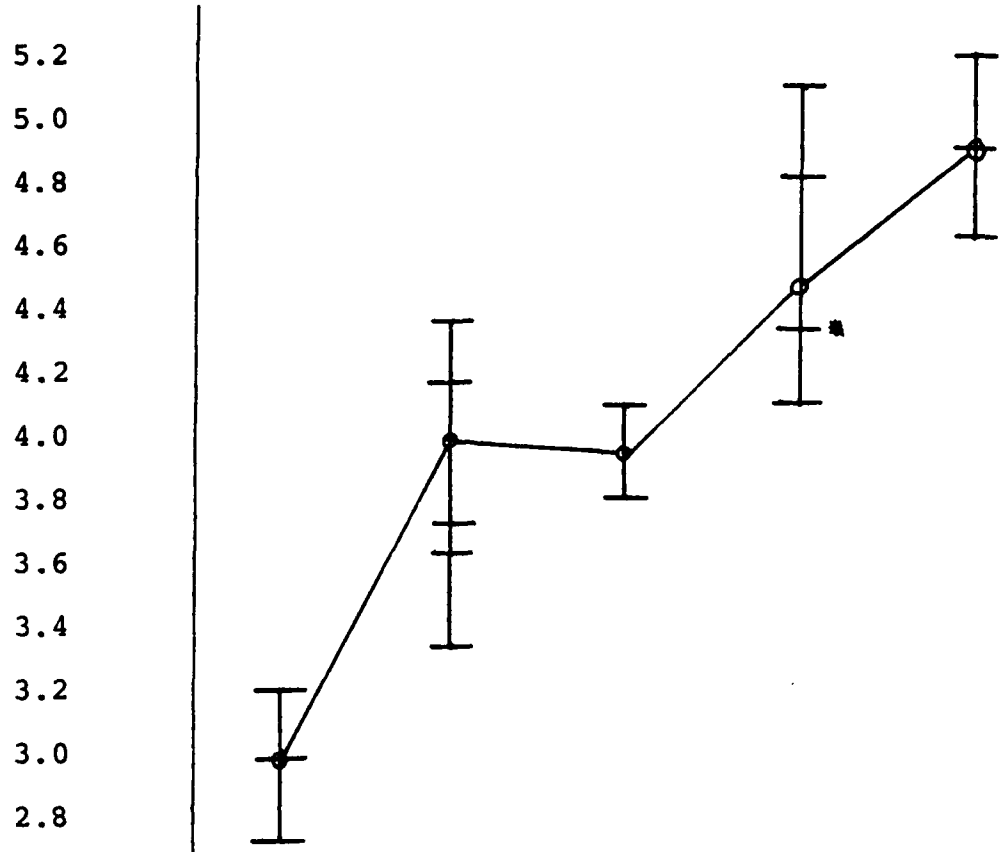
A Pearson correlation matrix was performed to obtain an overall impression of the relationship between the composite variables (see Appendix B). Group cohesion was found to be significantly correlated to interdependence, communication, supervisor influence, participation in goal

setting, and rewards from group membership at the $p < .001$ level. These findings are consistent with the literature discussed in Chapter II.

As stated earlier in Chapter II, the purpose of this study is to: (1) further investigate specific independent and moderating variables that appear to have the greatest relevance to the sample site, and (2) to enhance the body of knowledge regarding those variables for which previous research has reported inconsistent findings. Therefore, this research evaluated the relationship between cohesion and supervisor influence, employee participation in goal setting, group size, similarities of group members, and work group tenure.

Supervisor Influence. The relationship between group cohesion and supervisor influence was evaluated in a two-step process. First, the average group cohesion score was calculated for each group. This was used to identify the degree of variance among work groups in each cohesion category. Also, the total number of responses in each cohesion category were summed and divided to provide an average of supervisor influence. Secondly, t-tests were performed between cohesion categories to determine if there was any significant differences in supervisor influence.

The cohesion category averages for supervisor influence are contained in Figure 4.1. Also demonstrated



Group Cohesion	1 (Low)	2	3	4	5 (High)
Number of Groups	3	5	2	5	3
Supervisor Influence Average	3.0	4.0	3.9	4.5	4.9

- represents individual group score.

o represents cohesion category average.

* signifies duplicate scores.

Fig. 4.1. Relationship Between Group Cohesion and Supervisor Influence

in Figure 4.1 is the variation of the groups in each respective cohesion category. In Figure 4.1 the low cohesion category had an average score of 3.0 (slightly agree on the employee survey). The high cohesion category had an average value of 4.9 which is "almost agree" on the employee survey. Figure 4.1 demonstrates that there is a general increase in the favorable perception of one's supervisor as the cohesion category increases from low to high.

T-tests between the cohesion categories did show significant differences in perception of supervisor influence across the cohesion categories. A summary of the t-tests is presented in Table 4.8.

The t-tests presented in Table 4.8 illustrate that the "low cohesion" category had a significantly lower estimate of supervisor influence than did the "high cohesion" category. Groups in the "low cohesion" category also were statistically different in their perception of supervisor influence from the groups in the "medium cohesion" category. The "low to medium cohesion" category had a significantly lower estimate of supervisor influence than did the "medium to high cohesion" category. In analyzing Figure 4.1 and Table 4.8 it is obvious that the groups which perceived themselves as more cohesive also thought more highly of their supervisors than did the low cohesive groups. This finding is consistent with Braun's (1983)

TABLE 4.8

STUDENT'S T-TEST OF MEANS--POOLED VARIANCE
ESTIMATES OF SUPERVISOR INFLUENCE

Category	1 (LOW)	2 (LOW TO MED)	3 (MED)	4 (MED TO HIGH)	5 (HIGH)
1 (LOW)	-	***	**	***	***
2 (LOW TO MED)	***	-	N	*	**
3 (MED)	**	N	-	*	***
4 (MED TO HIGH)	***	*	*	-	N
5 (HIGH)	***	**	***	N	-

* $p < .05$
** $p < .01$
*** $p < .001$
N represents a nonsignificant t-test.

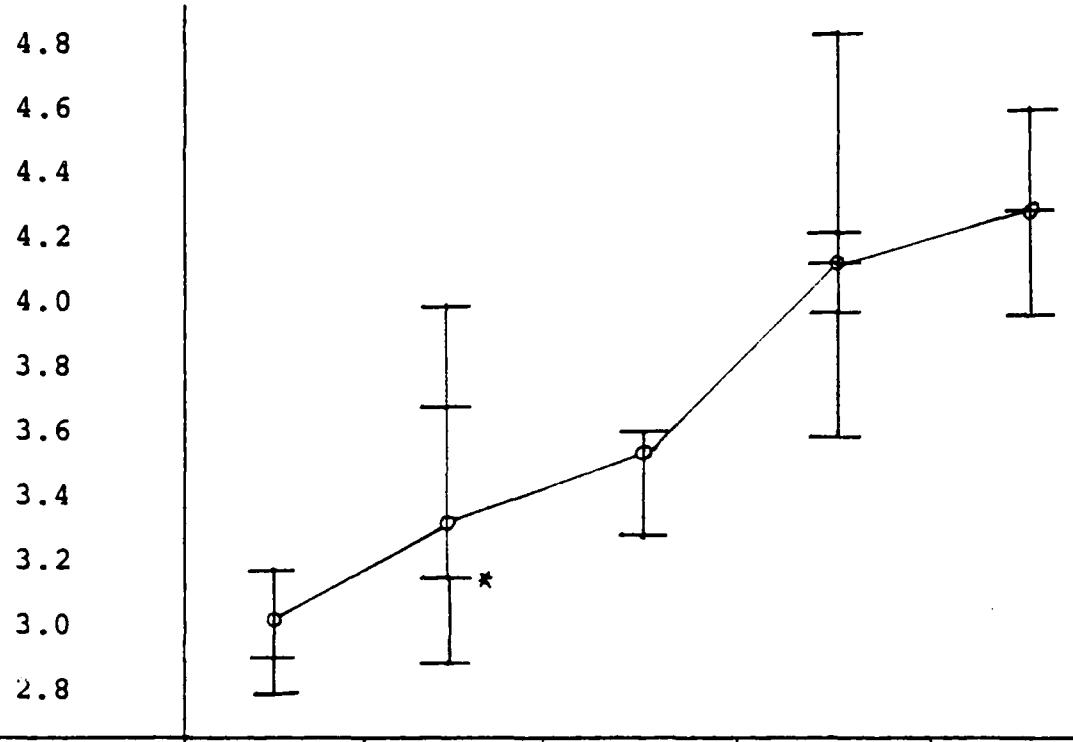
conclusion that supervisor influence, defined in a manner similar to this research, was positively related to group cohesion in U.S. Army units in Korea. The positive relationship found in this research is also indicative of Johns and others' (1984) appraisal of the influences of leadership. Johns and others, in their 1984 Defense Management Study Group on Military Cohesion, concluded that "In all the literature, the one constant is the finding that leadership is the most critical element in achieving cohesion (Johns and others, 1984:33).

Group members' participation in goal setting is another factor that is often cited as being essential to group cohesion. An analysis of the relationship between group cohesion and employees' participation in goal setting is presented next.

Participation in Goal Setting. The relationship between the degree to which employees participate in goal setting and the cohesion of the group was evaluated in a manner similar to that used in the evaluation of supervisor influence. Figure 4.2 illustrates the degree to which employees participate in goal setting within each category. Also evident in Figure 4.2 is the variation of the groups in each respective category.

Figure 4.2 indicates that the perception of being involved in goal setting is consistently higher as one moves from the low cohesion category to the high cohesion category. T-tests were performed using participation in goal setting to evaluate whether there was a significant difference between the cohesion categories. A summary of all the t-tests is presented in Table 4.9 (page 70).

The t-tests in Table 4.9 indicated several significant differences among the cohesion categories in participation in goal setting. The "low cohesion" category is significantly different from the "high cohesion" category. Also, the groups composing the "high cohesion" category



Group Cohesion	1 (Low)	2	3	4	5 (High)
Number of Groups	3	5	2	5	3
Participation in Goal Setting Average	3.0	3.3	3.5	4.1	4.3

- represents individual group score.

o represents cohesion category average.

* signifies duplicate scores.

Fig. 4.2. Relationship Between Group Cohesion and Participation in Goal Setting

TABLE 4.9

STUDENT'S T-TEST OF MEANS--POOLED VARIANCE
ESTIMATES OF PARTICIPATION IN GOAL SETTING

Category	1 (LOW)	2 (LOW TO MED)	3 (MED)	4 (MED TO HIGH)	5 (HIGH)
1 (LOW)	-	N	N	***	***
2 (LOW TO MED)	N	-	N	***	**
3 (MED)	N	N	-	*	*
4 (MED TO HIGH)	***	***	*	-	N
5 (HIGH)	***	**	*	N	-

* $p < .05$
** $p < .01$
*** $p < .001$
N represents a nonsignificant t-test.

were, at a minimum, significantly different ($p < .05$) from the groups considered "medium" or lower in cohesion. In fact, the data in Table 4.9 indicates that category four (medium to high cohesion) and five (high cohesion) are significantly different ($p < .001$) from categories two (low to medium cohesion) and one (low cohesion).

Table 4.9 is a vivid display of the difference in the employees' opportunity to participate in goal setting between groups in low and high cohesion categories. This finding supports Ingraham and Manning's suggestion that the more people share their aspirations and thoughts with

the group, the higher is the possibility that emerging goals will satisfy everyone (Ingraham and Manning, 1981: 11). Research by Pritchard (1981) indicates that when an employee commits himself to goal achievement and achieves the goal, the result is greater satisfaction.

Group Size. The size of the work group is a variable that can considerably modify the ability of the group to participate in goal setting. A review of the literature concerning group size provided inconsistent findings regarding the relationship between this moderating variable and group cohesion.

The relationship between size and group cohesion was evaluated in a two-step process. First, the eighteen work groups were placed into their respective cohesion category and their group size was individually identified (see Table 4.10). Secondly, the average size of the cohesion category was obtained by summing the total number of people in the work groups and dividing by the appropriate number of groups. The population size of the group was used, rather than the sample size, because individuals' responses to the cohesion questions was a function of the total number of people in the work group.

An evaluation of Table 4.10 indicates a trend downward in group size as the cohesion level goes upward, but the relationship of size to cohesion is problematic.

TABLE 4.10

GROUP COHESION AND SIZE

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5
Low Cohesion	Low to Medium Cohesion	Medium Cohesion	Medium to High Cohesion	High Cohesion
Groups	Groups	Groups	Groups	Groups
101 (N=14)	100 (N=13)	105 (N=7)	201 (N=25)	102 (N=7)
205 (N=38)	103 (N=9)	401 (N=18)	300 (N=13)	200 (N=10)
307 (N=12)	203 (N=26)		303 (N=7)	202 (N=14)
	305 (N=8)		405 (N=8)	
	403 (N=6)		406 (N=9)	
Mean = 21.3	Mean = 12.4	Mean = 12.2	Mean = 12.4	Mean = 10.3

Note that of the three largest work groups, one was in the low cohesion category (thirty-eight members), another in the low to medium cohesion category (twenty-six) members, and the third group was in the medium cohesion category (twenty-five members). Another finding that indicates a questionable relationship between size and group cohesion is that the "low cohesion" category and "low to medium cohesion" category had work groups with smaller size than some work groups in the "medium to high" or "high cohesion" categories. These results do not provide unambiguous proof of a direct relationship of group size and cohesion.

Similarities. The essence of group cohesion, as discussed in Chapter I, is that employees are in some way attracted to each other. To the extent that group members share certain characteristics, then there may be a common basis to facilitate personal relationships within the group. In this research, the relationship between similarities of group members and group cohesion was evaluated in two areas. First, work groups were compared in their mixture of civilian and military members to determine if predominately civilian, or military, groups would be more cohesive. Secondly, group members were compared according to their age to determine if homogeneity of age was associated with group cohesion. These investigations of the relationship of similarities of group members and group cohesion are presented next.

Uniformity of Membership. To evaluate the relationship between uniformity of members and group cohesion, the cohesion scale was used to classify groups into categories ranging from "low cohesion" to "high cohesion." However, the cases within these categories were not averaged together. Averaging the cases would hypothetically cause a misrepresentation of the data by averaging a high cohesive group with predominately civilian members and another high cohesive group with predominately military members. Table 4.11 does not indicate any pattern of civilian and military composition in high or low cohesion categories. Certain groups in the low cohesion category had less diversity within their groups than did high cohesion groups. Table 4.11 also shows that highly cohesive groups did not contain predominately civilian or military members. Also, groups that scored low in cohesion were not necessarily mixed. For example, one group (#205) that scored low in cohesion had a 95 percent civilian membership. These findings do not provide support for the notion that predominate civilian or military membership in a work group is related to group cohesion.

Uniformity of Age. Composition of the work group was also studied by evaluating the relationship between uniformity of age and group cohesion. The cohesion scale was again used to separate groups into specific categories. However, the total cases in each category were

TABLE 4.11

GROUP COHESION AND UNIFORMITY OF MEMBERSHIP

Category	Group #	Military	Civilian
Low Cohesion	101	5	9
	205	2	36
	307	4	38
Low to Med Cohesion	100	10	3
	103	6	3
	203	3	23
	305	6	2
	403	2	4
Medium Cohesion	105	7	0
	401	7	11
Medium to High Cohesion	201	2	23
	300	5	8
	303	3	4
	405	1	7
	406	0	9
High Cohesion	102	2	5
	200	3	7
	202	2	12

not combined to provide a single measure of the uniformity of age. Combining work groups would bias the result because hypothetically a high cohesion group with the majority of members over forty could be averaged with a highly cohesive group with a majority of twenty-year olds. This would create a huge variance in age, when in fact there was little variance in age in each of these separate groups. Table 4.12 illustrates the standard deviation of age within each work group. Table 4.12 does not show any trend to indicate cohesive groups have less variance in their age. In fact, the work groups in the low cohesion category were among the seven lowest in diversity of age. Also, group #101 in the "low cohesion category" had the lowest standard deviation of age.

There is a possible explanation for these findings. Employees who are relatively close in age may be very competitive. While one group member may be the same age as another group member, he or she may have a much lower position and salary in the work group. The equality in age between these certain employees and the inequality in their status may be a reason for resentment on behalf of the employee with the lower position and salary. Though this reasoning may not apply to all cases in the survey, it may be a contributing factor.

To compare the cohesion categories overall, the work group averages in each category were summed and

TABLE 4.12

GROUP COHESION AND UNIFORMITY OF AGE

Category 1 Low Cohesion		Category 2 Low to Medium Cohesion		Category 3 Medium Cohesion	
Group	Age Std Dev	Group	Age Std Dev	Group	Age Std Dev
101	1.13	100	2.50	105	2.00
205	1.78	103	2.56	401	2.38
307	1.81	203	1.51		
		305	2.95		
		403	1.79		

Category 4 Medium to High Cohesion		Category 5 High Cohesion	
Group	Age Std Dev	Group	Age Std Dev
201	2.04	102	2.61
300	2.70	200	2.56
303	3.49	202	1.26
405	1.30		
406	2.19		

divided by the respective number of groups. The average standard deviation of each cohesion category is provided in Table 4.13. Table 4.13 indicates that the low cohesion category had the lowest diversity of age.

TABLE 4.13

UNIFORMITY OF AGE BY COHESION CATEGORY

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5
Low Cohesion	Low to Medium Cohesion	Medium Cohesion	Medium to High Cohesion	High Cohesion
Average Std Dev	Average Std Dev	Average Std Dev	Average Std Dev	Average Std Dev
1.57	2.26	2.19	2.34	2.14

A theory that similarities promote group cohesion has been accepted by previous research (Newcomb, 1963). The data in this research effort did not give credence to the previous hypotheses that similarities in characterization of profession (military versus civilian) promote cohesion or that uniformity in age is positively related to group cohesion.

Work Group Tenure. The literature indicates that the amount of time people spend in their job positions affects the cohesion of the work group. Hare reported that the roles of newer groups are less structured and the

result is lower cohesion (Hare, 1976). To investigate this assertion, an evaluation of the respondents' answers to "How long have you been in your present job position?" was made. Information was not available about the non-participants' time in their present positions and therefore only the survey participants were used. The total number of cases in each cohesion category were summed and divided by their respective size to obtain a "time in position" average (see Table 4.14) Table 4.14 shows that the high cohesion category had the longest average "time in job position." However, this average was followed closely by the lowest cohesion category.

TABLE 4.14

LENGTH IN PRESENT JOB POSITION BY COHESION CATEGORY

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4	CATEGORY 5
Low Cohesion	Low to Medium Cohesion	Medium Cohesion	Medium to High Cohesion	High Cohesion
Mean = 4.6	Mean = 3.7	Mean = 3.3	Mean = 4.3	Mean = 4.8

T-tests were performed to evaluate whether there was a significant difference between the cohesion categories in their "average time in position." A summary of all the t-tests is provided in Table 4.15. A comparison of these groups shows that the "high cohesion" category was

TABLE 4.15

STUDENT'S T-TEST OF MEANS--POOLED VARIANCE ESTIMATES OF THE RELATIONSHIP OF GROUP COHESION AND WORK GROUP TENURE

	1 (LOW)	2 (LOW TO MED)	3 (MED)	4 (MED TO HIGH)	5 (HIGH)
1 (LOW)	-	*(1>2)	**(1>3)	N	N
2 (LOW TO MED)	*(1>2)	-	N	N	*
3 (MED)	**(1>3)	N	-	**	**
4 (MED TO HIGH)	N	N	**	-	N
5 (HIGH)	N	*	**	N	-

* $p < .05$
** $p < .01$
*** $p < .001$
N represents a nonsignificant t-test.

significantly different ($p < .05$) than the "low to medium cohesion" and "medium cohesion" categories. However, the low cohesion category was also significantly higher than the "low to medium cohesion" and "medium cohesion" categories. These data do not support Hare's assertion that groups composed predominately of members with long service will be characterized by high cohesion. There is a possible explanation for this finding. The essence of group cohesion is that people are attracted to one another. If people do get along well in a work group and these members remain in the work group, then the interrelationships among

the workers have a chance to become even stronger. After all, cohesion is "an emergent quality of relationships built on shared experience" (Ingraham and Manning, 1981:8). However, just the opposite situation may occur. Members of the work group may not be attracted to each other. The more time that an individual stays in his, or her, work group the greater the opportunity for conflict with the one or two people that the individual detests. Though this explanation may not be the single reason for the findings in this research, it may be a contributing factor.

Group Cohesion and Group Productivity Linkage

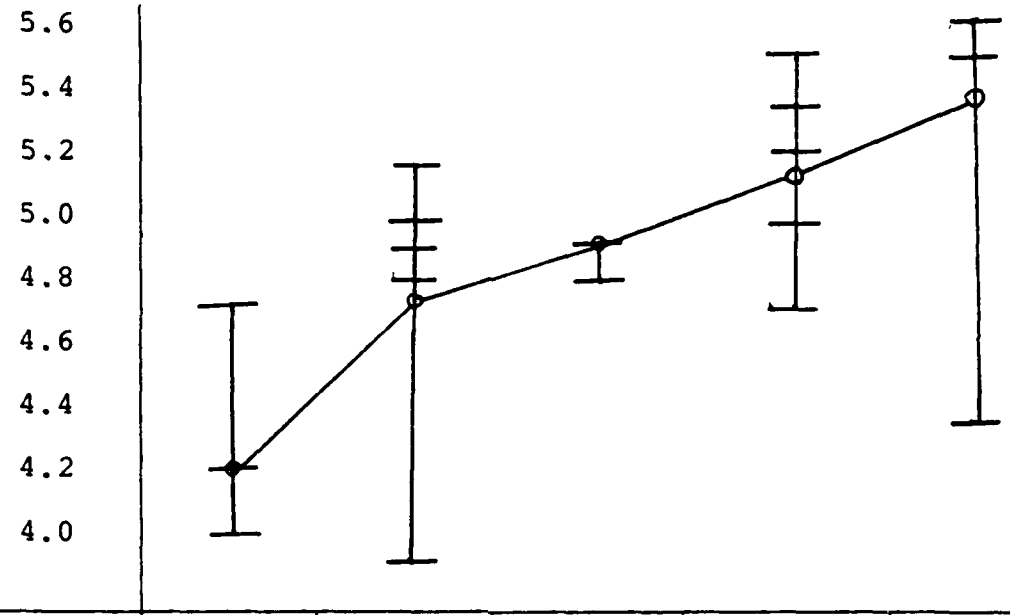
This research effort enabled us to look at the relationship between certain independent and moderating variables and group cohesion. Investigations of cohesion are useful because they provide managers with an understanding of the difference in attitudes between high and low cohesive work groups. However, to halt research at this point would only provide information on factors which may influence group cohesion. Information concerning the relationship between group cohesion and the work groups' performance should provide additional valuable information on how the cohesiveness of group members may influence the groups' productivity. To accomplish this objective, three methods of evaluating work groups were used. The first cohesion/productivity investigation is based on employee

perceptions of group productivity. Secondly, the supervisors of each work group completed an anonymous Supervisor's Rating Form (see Appendix D) on each member of their respective groups. These appraisal forms provided an attitudinal measure of the performance of the work group. Finally, actual productivity measures were collected for each group to determine whether the group was more productive at the time of the survey than in a previously designated time frame. These actual productivity measures provided an objective measurement of productivity.

Group Cohesion and Employee Perceived Productivity. Figure 4.3 illustrates the average perception of group performance within each cohesion category. This figure also displays the variation of the group averages in each respective category.

Figure 4.3 demonstrates that the average perception of group performance increases consistently from the low cohesion category to the high cohesion category. Following this analysis, t-tests were performed to further analyze the differences in perceived productivity between the cohesion categories. A summary of the t-tests is provided in Table 4.16 (page 84).

The significant differences in perception of performance (as shown in Table 4.16) among the "low cohesion" and "high cohesion" categories gives credence to Jewell



Group Cohesion	1 (Low)	2	3	4	5 (High)
Number of Groups	3	5	2	5	3
Perceived Group Perform-ance Average	4.2	4.7	4.9	5.1	5.3

- represents individual group score.

o represents cohesion category average.

* signifies duplicate scores.

Fig. 4.3. Relationship Between Group Cohesion and Emplcyee Perceived Group Performance

AD-A174 312 AN ASSESSMENT OF WORK GROUP COHESION AND PRODUCTIVITY 2/2
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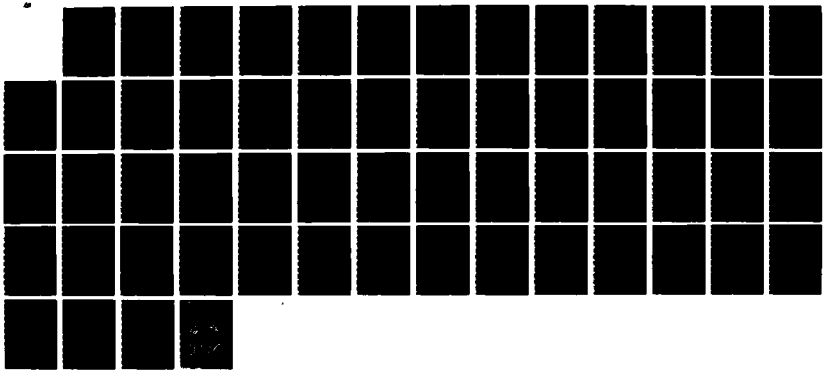
SCHOOL OF SYSTEMS AND LOGISTICS B S SMITH SEP 86
UNCLASSIFIED AFIT/GLM/LSB/86S-78 F/G 5/9 NL



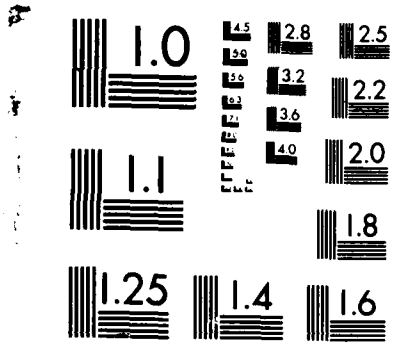


TABLE 4.16

STUDENT'S T-TEST OF MEANS--POOLED VARIANCE ESTIMATES OF THE RELATIONSHIP OF GROUP COHESION TO PERCEIVED GROUP PERFORMANCE

Category	1 (LOW)	2 (LOW TO MED)	3 (MED)	4 (MED TO HIGH)	5 (HIGH)
1 (LOW)	-	*	N	***	**
2 (LOW TO MED)	*	-	N	N	**
3 (MED)	N	N	-	N	N
4 (MED TO HIGH)	***	N	N	-	N
5 (HIGH)	**	**	N	N	-

* p < .05
** p < .01
*** p < .001
N represents a nonsignificant t-test.

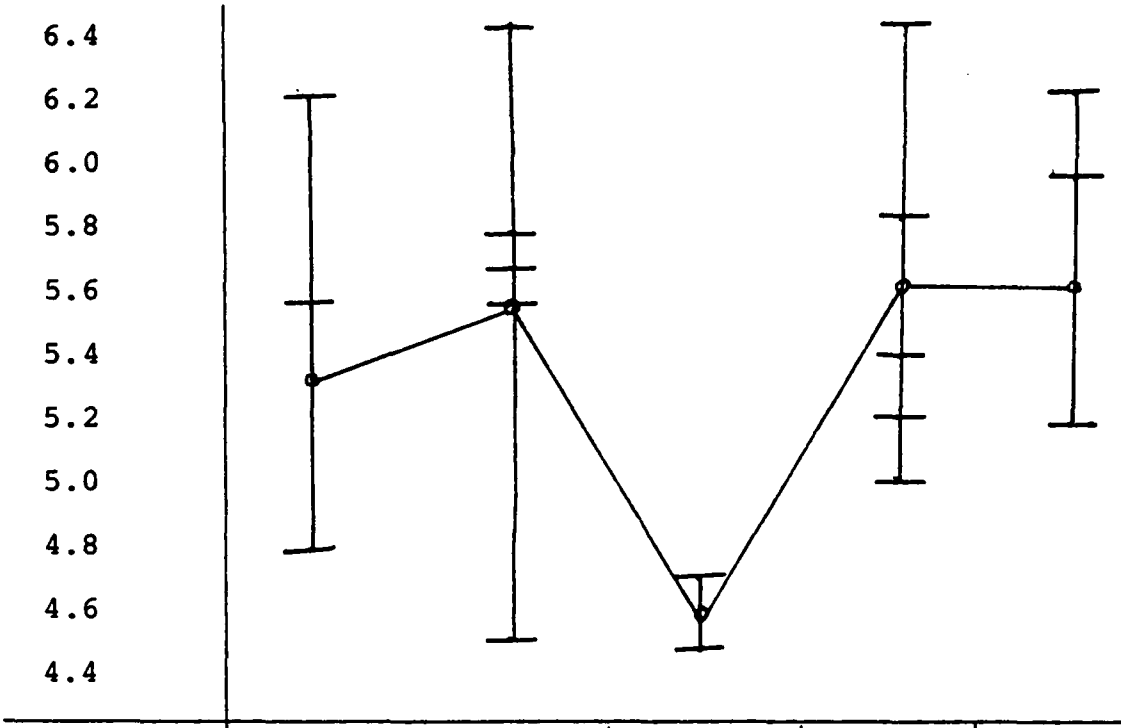
and Reitz' position that group cohesion does affect work members' perception of productivity. Jewell and Reitz stated that cohesive groups are "likely to be very favorable in its evaluation of its members, its importance, its tasks, and its performance" (Jewell and Reitz, 1981:26).

Supervisor Evaluation and Work Group Productivity. This portion of the study is based on the results of the supervisor's rating form which was discussed in Chapter III. The supervisor's rating form consisted of six questions (see Appendix D) which indicated the "typical" job

effectiveness of each employee. Figure 4.4 illustrates the average supervisor perception of productivity within each cohesion category and displays the variation of the groups. Evaluation of Figure 4.4 does not provide any indication that more cohesive groups are evaluated by their supervisors as being higher in performance. T-tests were performed to see if there were significant differences between the cohesion categories in supervisory perception of performance. A summary of the t-tests is illustrated in Table 4.17 (page 87).

The data in Table 4.17 does not provide any evidence to indicate that the supervisors of the more cohesive groups evaluated their employees as more productive. However, there are several possible explanations why a positive relationship between group cohesion and supervisory evaluation of productivity was not found.

The first explanation is that there was a bias in the evaluation by having the immediate supervisor rate the performance of each work member. Though the supervisor has the best knowledge of the employee's performance, the supervisor may have a tendency to inflate or deflate the group members' evaluation due to his or her personal relationships with the employees. Another explanation is that while some supervisors may have objectively rated their employees, other supervisors may have unconsciously wanted their work group to score high and subjectively rated the



Group Cohesion	1 (Low)	2	3	4	5 (High)
Number of Groups	3	5	2	5	3
Supervisor Perception Average	5.3	5.6	4.6	5.6	5.6

- represents individual group score.

o represents cohesion category average.

* signifies duplicate scores.

Fig. 4.4. Relationship Between Group Cohesion and Supervisory Perception of Group Performance

TABLE 4.17

STUDENT'S T-TEST OF MEANS--POOLED VARIANCE ESTIMATES OF SUPERVISORY PERCEPTIONS OF PERFORMANCE

Category	1 (LOW)	2 (LOW TO MED)	3 (MED)	4 (MED TO HIGH)	5 (HIGH)
1 (LOW)	-	N	*(1>3)	N	N
2 (LOW TO MED)	N	-	***(2>3)	N	N
3 (MOD)	*(1>3)	***(2>3)	-	***	***
4 (MED TO HIGH)	N	N	***	-	N
5 (HIGH)	N	N	***	N	-

* p < .05
** p < .01
*** p < .001
N represents a nonsignificant t-test.

members more highly than their normal productivity warranted. A third possible reason is that while most supervisors were enthusiastic about the research project, some did not take the evaluations seriously and failed to differentiate between high and low performing employees. While none of these explanations fully explains the results, they may have had a major impact on the findings. The final part of the evaluation of productivity was an evaluation of actual productivity measures for each group.

Cohesion and Actual Productivity Measures. As discussed in Chapter III, an attempt was made to collect

actual productivity measures for each work group. Unfortunately, productivity measures were not available for five of the eighteen work groups because of the qualitative nature of the work groups and the inability to objectively assess the work groups' performance.

The work groups were not compared against each other because of the different and unrelated responsibilities of each work group. Work groups were compared only to their previous performance. If necessary, when the situation arose, the author tried to use as much historical data as possible to provide comparisons. If this data was not available, trends were sought in the collected productivity measures that indicated the relative productivity of the group. These productivity measures were then evaluated and the groups were classified as having a decrease in productivity, no change in productivity, or an increase in productivity. The categorization of each group depended on how the groups' productivity compared to the earlier measured period or was determined by an analysis of the productivity of the group during the three-month period.

Admittedly, this approach provided a subjective method of studying group cohesion and performance. However, as Katz stated in his research of group cohesion and productivity, "In most . . . types of organizations it is very difficult to get objective measures of performance" (Katz, 1950:1). This research also differs from most

research studies of group cohesion and performance in that groups did not perform similar jobs, use the same equipment, or perform under the same working conditions. Most controlled experiments tend to put relationships such as group cohesion and performance into nice "neat" packages. The strength of this study's approach is that a realistic assessment was made of the actual, dynamic work setting. Discussions were held with section supervisors who were able to provide productivity standards that were directly related to the individual work groups.

The work groups, in this part of the research effort, will be presented in ascending order, from those in the low cohesion category, to those in the high cohesion category.

Low Cohesion Category. The low cohesion category contained three groups. The first group (#101) is responsible for the research and processing of supply requests to all base organizations. This work group had various priority and routine requests that had to be properly researched, documented, and processed through the supply system. The work group's productivity was evaluated by aggregating daily requests to obtain a weekly figure of the ratio of requests processed to the number of requests received. The number of requests received included the number of backlogged requests from the previous work week. This productivity measure had not been used previously by

management, but sufficient past data was available to make this a viable productivity standard.

A ten-week period, including the survey period, was compared to the previous ten weeks of data for this organization. The ratio for each ten-week period was determined by averaging the respective ten weeks' ratios. Even though the work load was different in these periods, in both cases the ratio was .95 of the documents processed to those received. Therefore, the work group was evaluated as having "no change in productivity."

The second group in the low cohesion category (#205) is responsible for the proper storage of warehouse supplies. The productivity measure used to evaluate this work group was a ratio of the number of improperly stored items to the total number of items that were stored properly. During the three-month period, 60,392 items were stored properly with only 55 discrepancies. In the previous six months, this work group properly stored 134,841 items with only 119 discrepancies. There was virtually no difference in the ratio between the two compared periods. Therefore, the group was given an evaluation of having "no change in productivity."

The third group in the low cohesion category (#307) is responsible for establishing the total number of requisitions in the supply system. The productivity measure used to rate this group was the total number of

requisitions they processed. The specified three months were compared with the previous six months. The three-month average was 7,615 requisitions. This was relatively low compared to the 8,909 average for the past six months. Though the work group does not control the number of supply requests, the fact that they were able to process over 1,000 more requisitions implies that the group was more productive in the previous six months. Therefore, this work group was categorized as having a "decrease in productivity."

Low to Medium Cohesion Category. The low to medium cohesion category consisted of five work groups. However, productivity measures could not be determined for two of the groups due to their qualitative nature. The first group in this category (#100) is responsible for the processing of routine and priority supply requests. This particular group could be thought of as the initial starting point for common requests through the base supply system. The performance of this work group was very difficult to measure because management did not collect any form of productivity measures for the group. Therefore, there was no past data to compare any devised productivity measure.

Through discussions with the senior section management, it was decided that the average number of documents processed weekly would be the best productivity measure.

Weekly averages of the number of documents were collected and the average was 840 documents. Two weeks had averages which were one standard deviation below the mean and one week was one standard deviation above the mean. The range of weekly documents ranged from 681 to 981. The interesting point about the performance measure was that the work group always processed the required number of documents by the end of the week. Even though the group experienced backlogs on routine requests on a daily basis, these requests were always processed by the end of the week. Therefore, the group was evaluated as having "no change in productivity."

The second group in the low to medium cohesion category (#305) is a supply retail outlet which is responsible for the issuance of personal retention items. An analysis of this work group showed a monthly average of 1,506 equipment issues during the three-month period. This compared with an average of 2,419 issues for the previous seven months. Though customer requests do dictate the amount of issues, this diversity does show that the group was low in productivity during this time compared to what it is capable of achieving. Therefore, the work group was evaluated as having a "decrease in productivity."

The third work group in the low to medium cohesion category (#403) is responsible for the timely filing of accountable documents. Documents that exceed the required

time to be processed through the supply system are referred to as delinquent documents. The productivity measure used for this group was the total number of delinquent documents compared to the total number of issues for that period. Table 4.18 illustrates the comparison of the time periods. The ratio of delinquent documents to total issues for the first four months was .0168. The average for the three months under study was .0115. Since there was a minimal change in the ratio of delinquent documents to total issues, the group was deemed as having "no change in productivity."

TABLE 4.18

DELINQUENT DOCUMENTS

Month	Total Issues	Total Delinquent Documents	Ratio
Dec	37,841	927	.0245
Jan	52,367	1080	.0206
Feb	41,019	519	.0127
Mar	45,066	426	.0095
Apr	44,726	319	.0071
May	33,685	672	.0199
June	41,572	308	.0074

Medium Cohesion Category. The medium cohesion category contained two work groups. The first group in this category (#105) was responsible for obtaining high priority parts in support of base weapon systems. The

productivity measure used for this work group was the number of requests processed per month.

The average number of requests processed for the three months under study was 310 as compared to 285 for the previous six months. The difference of only twenty-five documents processed was not considered significant and the work group was rated as having "no change in productivity."

The second work group in the "medium cohesion" category (#401) is responsible for computer operations for the supply squadron. Management analyzed, on a monthly basis, the number of hours that the computer was operational as compared to the total number of available hours. Management had established that the computer system should be operational for a ten-hour period during normal day hours. Therefore, management computed the percentage of the time the computer was operational during this period. The percentage was calculated by dividing the number of in-line computer hours by the number of expected in-line computer hours during the designated three-month period. This was compared with data that was available for the four previous months as a measure of productive computer support (see Table 4.19).

Table 4.19 illustrates that the three months associated with the survey had computer support only 59.5 percent of the expected in-line time as opposed to 76.6 percent of the in-line percentage during the four previous

TABLE 4.19

ANALYSIS OF COMPUTER SUPPORT

Month	In-Line Computer Hours / Expected In-Line Computer Hours
Dec	63.8 %
Jan	74.1 %
Feb	84.6 %
Mar	83.8 %
	Monthly Average = 76.6 %
April	78.3 %
May	40.6 %
June	59.6 %
	Monthly Average = 59.5 %

months. The productivity of the work group was quite low compared to a measure of the group's performance in the earlier period; therefore, this work group was evaluated as having "a decrease in productivity."

Medium to High Cohesion Category. There were five work groups in the "medium to high cohesion" category. However, two of the work groups were not evaluated due to the qualitative nature of people's job responsibilities and the inability of management to provide a measurable standard.

The first group in this category (#201) is responsible for the delivery of supplies and equipment to supported agencies within required time frames. Senior management and the author jointly discussed this work group

and concluded that an appropriate productivity measure would be a ratio of the late priority deliveries as compared to the number of on-time deliveries. Unfortunately, previous data for this work group was not available for comparison. A comparison of the ratio of late deliveries to on-time deliveries is provided in Table 4.20.

TABLE 4.20

ANALYSIS OF DELIVERY OPERATIONS

Week	Total Priority Deliveries	Late Priority Deliveries	Percent Late Deliveries
1	337	90	26.71
2	346	56	16.18
3	376	31	8.24
4	359	76	21.17
5	351	85	24.22
6	360	58	16.11
7	393	35	8.91
8	273	35	12.82
9	617	45	7.29
10	147	47	31.97
11	290	28	9.66
12	204	19	9.31
13	282	52	18.44

The average percent of late deliveries was 16.23 percent. The highest percentage of late deliveries in a week was almost 32 percent and the lowest percentage of late deliveries was 7 percent. This work group is required

to deliver supplies to a very diverse number of locations and information was not available regarding whether the required time frames for these deliveries were realistic. The wide variance in the number of late deliveries does suggest that management attention is needed in this area; however, the collected productivity measures for the work group does not provide substantial evidence to conclude the productivity of the work group was poor. Therefore, this work group was classified as having "no change in productivity."

The second work group in the "medium to high cohesion" category (#300) is responsible for the provisioning and allocation of equipment items. The productivity measure that was used for this group was a comparison of the number of equipment requests received with the actual number processed. In the three months associated with the employee survey, the work group had 3,616 equipment requests and processed 3,571. This resulted in a .99 ratio of processed requests to received requests. An analysis of the previous six months showed that the work group had 4,759 equipment requests and processed 4,445 requests. This comparison resulted in a .93 ratio of processed requests to received requests. The 6 percent increase in the ratio of processed requests to received requests illustrated that there was an increase in the productivity of the work group. Because of this finding, this

work group was classified as having "an increase in productivity."

The third work group in the "medium to high cohesion" category (#303) is responsible for the issuing of common base items such as pencils, stationary, etc. Several discussions with management indicated that the only measure of productivity would be to compare the total number of processed supply issues per month. Though the workers have no control over the number of requests, an increase in the number of supply issues does indicate that more was accomplished with the same personnel. The three-month period under study was compared with seven previous months. The seven-month average was 8,666 compared to the three-month average of 9,912. This average increase of over 1,000 items per month provided support to classify the work group as having "an increase in productivity."

High Cohesion Category. There were three work groups in the high cohesion category. Unfortunately, one work group (#202) was not quantifiable and therefore could not be evaluated.

The first work group evaluated (#102) is responsible for the update of computer files to reflect any changes to item records. They are essentially responsible for ensuring that the proper quantity, price, and identification codes of over 15,000 items are maintained.

The productivity of the work group was difficult to quantify since productivity measures were not collected on a weekly or monthly basis. However, the section supervisor was very knowledgeable about the number of inputs that the group made weekly to the computer. The section supervisor provided a written description of the job activities in the work group and contained in this description was an estimate that the work group made 400 updates to the computer weekly. Unfortunately, in the three months of study associated with the employee survey, the computer was down for certain periods of time and because of the computer down-time, inputs to the computer were frequently not possible. Therefore, a daily average was calculated for the thirty-eight days that inputs were made. The average for the thirty-eight day period was 104 per day. By multiplying this figure by five working days, the equivalent of a working week was determined. This calculation provided an estimated weekly average of 520 inputs per week. The 520 inputs is far above the 400 written estimate provided by the supervisor. These figures indicate that the group was more productive during this period than they are against a standard provided by the section supervisor. Therefore, this group was classified as having an "increase in productivity."

The second work group evaluated in "the high cohesion" category is responsible for the inspection, delivery,

and stocking of small throw-away items. After various discussions with the section management, it was decided that an appropriate productivity measure of the work group was the bench stock fill rate. This productivity measure reflected the ability of this work group to provide stock on request to supported agencies. The average fill-rate for the three-month period of interest was 96.6 percent. The fill rate for the previous six-month period was 96.3 percent. Since analysis of the three months associated with the employee survey did not show an appreciable difference from the previous six months regarding the bench stock fill rate, the work group was categorized as having "no change in productivity."

Summary of Productivity Measures. A summary of the findings of the productivity measures is provided in Table 4.21. The productivity measures did indicate a generally positive trend from the low to high cohesion categories. The "low cohesion" category and "low to medium cohesion" category contained four groups that reflected "no change in productivity" and two work groups that showed a "decrease in productivity." The results are in great contrast to those found in the "medium to high cohesion" category and "high cohesion" category where three of the five groups had an "increase in productivity" and two work groups indicated "no change in productivity." Though the findings indicate a limited

TABLE 4.21

PRODUCTIVITY ANALYSIS OF WORK GROUPS

Low Cohesion Category	Change in Productivity
Group 101	None
Group 205	None
Group 307	Decrease
Low to Medium Cohesion Category	**Change in Productivity**
Group 100	None
Group 305	Decrease
Group 403	None
Medium Cohesion Category	**Change in Productivity**
Group 105	None
Group 401	Decrease
Medium to High Cohesion Category	**Change in Productivity**
Group 201	None
Group 300	Increase
Group 303	Increase
High Cohesion Category	**Change in Productivity**
Group 102	Increase
Group 200	None

association between group cohesion and productivity, the lack of statistical significance between the work groups' productivity scores and cohesion values preclude any confirmation of a relationship between these two variables. Chapter V summarizes the analyses presented in this chapter and addresses the investigative questions and hypotheses formulated in Chapter II.

V. Results and Conclusions

Overview

This chapter is divided into four sections. First, the hypotheses and investigative questions presented in Chapter II are tested and discussed. Secondly, information from this research that has particular relevance to managers will be discussed. Next, areas for future research are suggested. Finally, a summary of the entire research is provided.

Investigative Questions and Tests of Hypotheses

Investigative Question #1. What variables, relevant to work groups and this study, affect cohesion?

The literature review indicated that leadership had a major influence on group cohesion. Braun's (1983) study of U.S. Army units in Korea and Horsfall and Arensberg's (1949) study of work groups testified to the importance of the supervisors' influence on group cohesion. Therefore, Hypothesis 1.1 was formulated.

Hypothesis 1.1. The favorable review of the group supervisor by the group members is positively related to group cohesion.

Results. The analyses in Chapter IV indicate that there were significant differences between

the cohesion categories regarding supervisor influence. This is demonstrated by the "high cohesion" category and "medium to high cohesion" category being significantly different than the "medium cohesion" category and lower cohesion categories at the $p < .05$ level. The "high cohesion" category was different than the "medium cohesion" category and lower cohesion categories at the $p < .01$ level. These significant differences provide strong support for Hypothesis 1.1.

Participation in goal setting was a variable that was favorably reviewed as having a positive influence on group cohesion. Tannenbaum and others (1961) stated in their discussion of goal setting,

> It may be that through participation, the subordinate, who formerly was moved to contribute his services only because he sought, for example, security and financial rewards, now comes to be moved additionally because he recognizes that the success of the enterprise in turn will enhance his own ability to satisfy his needs. (Tannenbaum and others, 1961:95-96)

In response to the evidence in the current literature regarding the importance of goal setting toward group cohesion, Hypothesis 1.2 was formulated.

Hypothesis 1.2. Participation in goal setting is positively related to group cohesion.

Results. There were significant differences found between the cohesion categories in participation in goal setting. This is demonstrated by the "high cohesion" category being significantly different

than the "medium cohesion" category and lower cohesion categories at the $p < .05$ level. The "low cohesion" category was significantly different than the "medium to high cohesion" category and the "high cohesion" category at the $p < .001$ level. These significant differences indicate strong support for Hypothesis 1.2.

The size of the work group is a moderating variable that is commonly addressed in the literature as influencing group cohesion. Viteles (1953), Porter and Lawler (1965), and Hare (1976) all found that increasing size of the group is to the detriment of the development of group cohesion and group productivity. These studies resulted in the formulation of Hypothesis 1.3.

Hypothesis 1.3. Group size is negatively related to group cohesion.

Results. A comparison of the cohesion categories revealed that various groups in the "low cohesion" category and "low to medium cohesion" category contained less members than several groups in the "medium to high cohesion" category and "high cohesion" category. These findings lead to the rejection of Hypothesis 1.3.

Investigative Question #2. How does the composition of the work group affect the cohesion level?

Braun, in his study of U.S. Army units in Korea, stated "the more similar the individuals in a group are in

terms of age, geographic origin, education, culture, experiences, etc. the more likely strong group norms will develop" (Braun, 1983:33). The advocation of this statement led to Hypothesis 2.1.

Hypothesis 2.1. Work groups that contain either predominately military members or civilian members will have a higher cohesion level than groups with a relatively equal distribution of both civilian and military members.

Results. A comparison of the cohesion categories did not indicate that the more cohesive groups had higher percentages of predominately civilian or military members. Work groups in the "high cohesion" category, except for one group, did not contain a large percentage of civilian or military members. Also, one group in the "low cohesion" category had a 95 percent civilian membership. These findings led to the rejection of Hypothesis 2.1.

Newcomb (1963) suggested that similarities among the members of the work group was the biggest factor in realizing cohesive groups. Disagreement does exist, however, on this point. Seashore's 1954 study of the effect of similarities on group cohesion resulted in an inconclusive finding. A 1968 study by Cartwright and Zander indicated that dissimilarities may be a source of attraction

for some group members. This review of the literature resulted in the following hypothesis.

Hypothesis 2.2. Work groups that are relatively uniform in age will have a higher degree of group cohesion.

Results. The comparison of "high cohesion" groups with "low cohesion" groups did not show any indication that uniformity of age is associated with high cohesion. In fact, the work groups in the low cohesion were among the seven lowest in diversity of age. Therefore, Hypothesis 2.2 was rejected.

Pelz and Andrews (1966) reported that cohesion was higher within groups that had been together longer. Ingraham and Manning stated,

> The more time people are together, the greater the chance they will discover, invent and experience commonalities to include a shared understanding of group history. From such common experiences, group norms and standards emerge, accompanied by sentiments of loyalty, trust and commitment to the group and other group members. (Ingraham and Manning, 1981:9)

Pelz and Andrews' findings and Ingraham and Manning's insight gave rise to Hypothesis 2.3.

Hypothesis 2.3. Work groups that contain members with longer service in their present work groups are characterized by a higher degree of group cohesion.

Results. An analysis of the cohesion categories with respect to work tenure revealed that the "high cohesion" category had the highest average

time in one's present job position. However, the "low cohesion" category had the second highest average of time in the present job position. T-tests demonstrated that the "high cohesion" category and "low cohesion" category were significantly different than the "low to medium cohesion" category and "medium cohesion" category. This analysis led to the rejection of Hypothesis 2.3.

Investigative Question #3. What relationship is there between group cohesion and how people view the performance of their work group?

Jewell and Reitz stated that cohesive groups are "likely to be very favorable in its evaluation of its members, its importance, its tasks, and its performance" (Jewell and Reitz, 1981:26). Hypothesis 3.1 is an extension of this position.

Hypothesis 3.1. Group cohesion is positively related to perceived group productivity.

Results. A comparison of the cohesion categories did show a significant difference in perception of group productivity. The "low cohesion" category was significantly different from the "medium to high cohesion" category and "high cohesion" category at the $p < .01$ level. The "low cohesion" category was significantly different than the other categories except for the "medium cohesion" category at the $p < .05$ level. These results provide general support for Hypothesis 3.1.

Investigative Question #4. How does group cohesion affect group performance?

The literature on the relationship between group cohesion and performance in work groups provides conflicting evidence. A review of three major studies of cohesion and productivity in work groups showed a positive relationship (Strupp and Hausman, 1953), a negative relationship (Horsfall and Arensberg, 1949), and no relationship (Katz, Maccoby, and Morse, 1950). However, Strupp and Hausman's study of group cohesion and productivity was conducted in military support groups and provides the greatest likeness to this research effort. Therefore, Hypothesis 4.1 is an extension of their research.

Hypothesis 4.1. Group cohesion is positively related to group productivity.

Results. The supervisor's rating form did not produce any significant finding that more cohesive groups are evaluated higher by their supervisors. The actual productivity measures did show that overall, the high cohesive groups were rated as "more productive." The "low cohesion" category and "low to medium cohesion" category contained four groups that were rated as having "no change in productivity" and two groups were found to have a "decrease in productivity." The "medium to high cohesion" category and "high cohesion" category contained three groups which were rated as having an "increase in

productivity" and two groups that were evaluated as having "no change in productivity." However, these results did not provide any statistical support for the premise that group cohesion does have a positive relationship with work group productivity. Due to the weak association between group cohesion and productivity, Hypothesis 4.1 was not accepted.

Implication of Research for Managers

This research has implications for both military and civilian managers. First, specific implications from the research will be discussed for military managers. Then, implications from the research will be discussed that apply to both civilian and military managers.

The concept of cohesion has simply been ignored for too long in the military. One reason for this is the negative attitude that commanders have shown toward the importance of cohesion (Ingraham and Manning, 1981). Ingraham and Manning, in their research of group cohesion and productivity in the military, stated that the attitude of commanders toward cohesion was typical of the following commander's response: "The enemy will take care of our cohesion building. Right now, my job is training, not making the troops feel good" (Ingraham and Manning, 1984:2). This misguided perception of cohesion and its influence must be corrected. It is hoped that additional studies

will be performed by military researchers in logistics functions to assess the relationship of group cohesion to group productivity.

The fact that this research was conducted in a military setting does not diminish its applicability to civilian organizations. If cohesion is related to work group performance, then there can be obvious cost savings involved. Increased cohesion can lead to a substantial money savings for civilian organizations as well as savings for military organizations.

The strength of this research is that it confirmed the strong relationship of several variables with regard to group cohesion. Managers should be aware that supervisors have a significant impact on the cohesion of the group. The supervisors' treatment of employees was shown to be significantly related to group cohesion.

Areas for Future Research

This research effort identified three areas which deserve additional attention. The supervisors in the supply squadron had considerable difficulty in identifying productivity standards for certain work groups. This point does not invalidate the worth of the supervisors, but indicates the lack of attention that is given to measuring the productivity of work units in supply squadrons. Further attention should be given in the Air Force base

supply system to identify productivity standards for each work group.

Another area which needs additional research is the specific nature of the relationship between cohesion and productivity. Longitudinal studies are needed to determine whether improvements in cohesion lead to greater productivity or increased productivity leads to greater cohesion.

A final area that should be considered is the researcher's measurement of work group productivity. Strupp and Hausman (1953), in their evaluation of logistics work groups, used selected supervisors to rank order groups' productivity. This may provide a more objective viewpoint of employees' performance than having the immediate supervisors evaluate their own work groups.

Summary and Conclusions

This research was accomplished in two phases. First, the study investigated the strength of the relationship between cohesion and several variables that the literature reviewed as being strongly associated with group cohesion. The strength of association that these variables had with cohesion was tested using a sample of employees from a military supply squadron. Secondly, the research studied the relationship between group cohesion and work group performance through employee and supervisory

perceptions of group productivity and through the collection of actual productivity measures.

The variables that were significantly related to group cohesion were interdependence, communication, supervisor influence, participation in goal setting, rewards, and employee perceptions of group performance at the $p < .001$ level. The development of a cohesion scale resulted in observed significant differences between low and high cohesive groups in supervisor influence, participation in goal setting, and employee perceptions of group productivity. The supervisors' evaluation of group productivity did not support the hypothesis that group cohesion is positively related to group productivity. The actual productivity measures showed a weak association with group cohesion, but the lack of statistical evidence of this relationship precluded any support for the notion that group cohesion is related to group productivity. Several implications of the research to military and civilian managers were explained and recommendations were made for further investigation of cohesion/productivity relationships.

Appendix A: Composite Variables

RELIABILITY ANALYSIS - SCALE (COHESION)

1.	Q12	can't wait to move
2.	Q13	really part of group
3.	Q14	most get along better than us
4.	Q15	each day I look forward
5.	Q16	high spirit of teamwork
6.	Q17	personal interest in each other
7.	Q18	I would still stay here
8.	Q19	atmos is friendly and relaxed
9.	Q20	feel accepted by members
10.	Q21	co-workers don't know how to treat
11.	Q22	like the people

CORRELATION MATRIX

	Q12	Q13	Q14	Q15	Q16
Q12	1.0000				
Q13	.2934	1.0000			
Q14	.1748	.2925	1.0000		
Q15	.4345	.5301	.3328	1.0000	
Q16	.3128	.5996	.4201	.5845	1.0000
Q17	.3050	.4333	.2426	.5385	.6126
Q18	.5264	.5331	.3927	.5158	.4723
Q19	.3245	.4981	.4627	.4939	.6300
Q20	.3052	.6258	.3627	.5870	.5692
Q21	.3494	.4031	.4634	.3593	.4767
Q22	.2194	.4967	.3758	.4997	.4260

	Q17	Q18	Q19	Q20	Q21
Q17	1.0000				
Q18	.4869	1.0000			
Q19	.5734	.5154	1.0000		
Q20	.6062	.4953	.6028	1.0000	
Q21	.4234	.4481	.6065	.5173	1.0000
Q22	.5115	.4471	.5250	.6943	.3964

	Q22
Q22	1.0000

RELIABILITY COEFFICIENTS 11 ITEMS

ALPHA = .9020 STANDARDIZED ITEM ALPHA = .9059

RELIABILITY ANALYSIS - SCALE (INTERDEP)

1. Q23 depend directly on co-workers
2. Q24 depend on for information

CORRELATION MATRIX

	Q23	Q24
Q23	1.0000	
Q24	.5235	1.0000

RELIABILITY COEFFICIENTS 2 ITEMS

ALPHA = .6872 STANDARDIZED ITEM ALPHA = .6872

RELIABILITY ANALYSIS - SCALE (COMMUNIC)

1. Q38 usually aware of important events and si
2. Q39 people make my job easier by sharing ide
3. Q40 group knows what is needed
4. Q41 clear idea of groups goals
5. Q42 aware of squadrons goals

CORRELATION MATRIX

	Q38	Q39	Q40	Q41	Q42
Q38	1.0000				
Q39	.4959	1.0000			
Q40	.4470	.5385	1.0000		
Q41	.4976	.5404	.7055	1.0000	
Q42	.3685	.3431	.3371	.5525	1.0000

RELIABILITY COEFFICIENTS 5 ITEMS

ALPHA = .8206 STANDARDIZED ITEM ALPHA = .8234

R E L I A B I L I T Y A N A L Y S I S - S C A L E (S U P E R V I S)

1.	Q53	people given proper resp
2.	Q54	evaluation systems are fair
3.	Q55	supervisor treats everyone same
4.	Q60	supervisor makes sure subor have clear g
5.	Q61	supervisor tends to play favorites
6.	Q62	supervisor is not technically qual

CORRELATION MATRIX

	Q53	Q54	Q55	Q60	Q61
Q53	1.0000				
Q54	.5697	1.0000			
Q55	.5375	.5218	1.0000		
Q60	.5515	.4902	.5125	1.0000	
Q61	.4381	.4074	.6694	.3892	1.0000
Q62	.3146	.3425	.4229	.3495	.5865

	Q62
Q62	1.0000

RELIABILITY COEFFICIENTS 6 ITEMS

ALPHA = .8430 STANDARDIZED ITEM ALPHA = .8437

R E L I A B I L I T Y A N A L Y S I S - S C A L E (P A R T I C I P)

1.	Q43	goals determined with out my input
2.	Q44	all had chance to discuss goals
3.	Q45	I took an active part in discussing goal
4.	Q46	frequently made aware of inspections
5.	Q58	allowed to participate in decis affect m

CORRELATION MATRIX

	Q43	Q44	Q45	Q46	Q58
Q43	1.0000				
Q44	.4342	1.0000			
Q45	.4426	.6269	1.0000		
Q46	.1404	.4238	.4189	1.0000	
Q58	.2260	.4742	.4363	.4482	1.0000

RELIABILITY COEFFICIENTS 5 ITEMS

ALPHA = .7765 STANDARDIZED ITEM ALPHA = .7745

RELIABILITY ANALYSIS - SCALE (REWARDS)

1. Q29 satisfied with amt. of respect from co-w
2. Q30 satisfied with chances to accomp someth

CORRELATION MATRIX

	Q29	Q30
Q29	1.0000	
Q30	.7096	1.0000

RELIABILITY COEFFICIENTS 2 ITEMS

ALPHA = .8285 STANDARDIZED ITEM ALPHA = .8297

RELIABILITY ANALYSIS - SCALE (PERFORMA)

1. Q63 quantity of output is very high
2. Q64 quality of output is very high
3. Q65 when high priority work arises outstan j
4. Q66 group always gives maximum effort

CORRELATION MATRIX

	Q63	Q64	Q65	Q66
Q63	1.0000			
Q64	.8091	1.0000		
Q65	.5960	.6697	1.0000	
Q66	.5897	.6062	.6986	1.0000

RELIABILITY COEFFICIENTS 4 ITEMS

ALPHA = .8824 STANDARDIZED ITEM ALPHA = .8866

R E L I A B I L I T Y A N A L Y S I S - S C A L E (S U P E R E V A L)

1.	Q1	quantity of output
2.	Q2	quality of work
3.	Q3	efficiency of work
4.	Q4	problem solving capacity
5.	Q5	adaptability flexibility
6.	Q6	overall effectiveness

CORRELATION MATRIX

	Q1	Q2	Q3	Q4	Q5
Q1	1.0000				
Q2	.8139	1.0000			
Q3	.7877	.7987	1.0000		
Q4	.7035	.7513	.7501	1.0000	
Q5	.7412	.8040	.7490	.7518	1.0000
Q6	.8005	.8087	.8503	.8526	.8760

	Q6
Q6	1.0000

RELIABILITY COEFFICIENTS 6 ITEMS

ALPHA = .9573 STANDARDIZED ITEM ALPHA = .9590

Appendix B: Pearson Correlations

PEARSON CORRELATION COEFFICIENTS

	GC	II	RI	COMM	SIM	SUPCRED
GC	1.0000 (0) P= .	.1014 (175) P= .091	.2583 (178) P= .000	.6974 (177) P= .000	.3118 (176) P= .000	.5680 (170) P= .000
II	.1014 (175) P= .091	1.0000 (0) P= .	.1179 (182) P= .057	.1500 (176) P= .023	-.0160 (180) P= .416	-.0469 (172) P= .271
RI	.2583 (178) P= .000	.1179 (182) P= .057	1.0000 (0) P= .	.1494 (181) P= .022	.1574 (182) P= .017	.2321 (174) P= .001
COMM	.6974 (177) P= .000	.1500 (178) P= .023	.1494 (181) P= .022	1.0000 (0) P= .	.2818 (180) P= .000	.5592 (171) P= .000
SIM	.3118 (176) P= .000	-.0160 (180) P= .416	.1574 (182) P= .017	.2818 (180) P= .000	1.0000 (0) P= .	.2152 (172) P= .002
SUPCRED	.5680 (170) P= .000	-.0469 (172) P= .271	.2321 (174) P= .001	.5592 (171) P= .000	.2152 (172) P= .002	1.0000 (0) P= .
PARGOALS	.5593 (169) P= .000	.1502 (173) P= .024	.1374 (175) P= .035	.6476 (173) P= .000	.3194 (174) P= .000	.5641 (169) P= .000
REWARD	.7845 (177) P= .000	.1054 (181) P= .079	.2509 (184) P= .000	.7159 (181) P= .000	.2344 (182) P= .001	.5516 (173) P= .000
PERF	.4563 (157) P= .000	-.0081 (159) P= .460	.0868 (161) P= .137	.5722 (159) P= .000	.1850 (158) P= .010	.4552 (156) P= .000

GC = Cohesion
II = Not applicable
RI = Interdependence
COMM = Communication
SIM = Similarities
SUPCRED = Supervisor Influence
PARGOALS = Participation in Goal Setting
REWARD = Rewards
PERF = Employee Perception of Group Performance

PEARSON CORRELATION COEFFICIENTS

	PARGOALS	REWARD	PERF
GC	.5593 (169) P= .000	.7845 (177) P= .000	.4563 (157) P= .000
II	.1502 (173) P= .024	.1054 (181) P= .079	-.0081 (159) P= .460
RI	.1374 (175) P= .035	.2509 (184) P= .000	.0868 (161) P= .137
COMM	.6476 (173) P= .000	.7159 (181) P= .000	.5722 (159) P= .000
SIM	.3194 (174) P= .000	.2344 (182) P= .001	.1850 (158) P= .010
SUPCRED	.5641 (169) P= .000	.5516 (173) P= .000	.4552 (156) P= .000
PARGOALS	1.0000 (0) P= .	.5707 (175) P= .000	.3625 (156) P= .000
REWARD	.5707 (175) P= .000	1.0000 (0) P= .	.5025 (160) P= .000
PERF	.3625 (156) P= .000	.5025 (160) P= .000	1.0000 (0) P= .

Appendix C: Employee Survey

PLEASE DO THE FOLLOWING STEPS:

1) FIND THE NAME OF THE UNIT THAT YOU WORK IN ON THE NEXT TWO PAGES.

2) CIRCLE THE NAME OF THE UNIT AND THE WORK CODE NUMBER THAT CORRESPONDS TO IT.

3) WHEN FINISHED, GO TO THE BEGINNING OF THE SURVEY AND READ THE DIRECTIONS.

OPERATIONS SUPPORT SECTION

WORK CODE	OFFICE SYMBOL	UNIT
100	DMSCDD	Demand Processing Sub-unit
101	DMSCDI	Item Research Sub-unit
102	DMSCDR	Records Maintenance Sub-unit
103	DMSCR1	Supply Point #1
104	DMSCR2	Supply Point #2
105	DMSCM	Micap
106	DMSCW	War Readiness Unit
107	DMSCX	Oprs. Sup. Unit, Area B Service Center

****

MATERIEL STORAGE AND DISTRIBUTION SECTION

WORK CODE	OFFICE SYMBOL	UNIT
200	DMSDB	Bench Stock Support Unit
201	DMSDD	Pickup and Delivery Unit
202	DMSDI	Inspection Unit
203	DMSDR	Receiving Unit
204	DMSDR	Receiving Unit (Turn-In)
205	DMSDS	Storage and Issue Unit

MATERIEL MANAGEMENT SECTION

WORK CODE	OFFICE SYMBOL	UNIT
300	DMSME	Equipment Management Unit
301	DMSMK	Munitions Management Unit
302	DMSMM	Mobility Unit
303	DMSMRB	Base Service Store Sub-unit
304	DMSMRT	Tool Issue Sub-unit
305	DMSMRI	Individual Equipment Sub-unit
306	DMSMSR	Requirements Sub-unit
307	DMSMSQ	Requisitioning Sub-unit

****

MANAGEMENT AND SYSTEMS SECTION

WORK CODE	OFFICE SYMBOL	UNIT
400	DMSPA	Administration Unit
401	DMSPCA	ADPE Sub-unit
402	DMSPCC	FCAM/Distribution Sub-unit
403	DMSPD	Document Control Unit
404	DMSPF	Funds Management Unit
405	DMSPI	Inventory Unit
406	DMSPP	Procedures and Analysis Unit
407	DMSPT	Customer Service and Training Unit
408	DMSPTC	Customer Liaison Sub-unit

This survey is in two parts. Part one is a short series of demographic questions and part two contains opinion questions. Please read the questions carefully, answer them honestly and circle the number next to the answer that best describes you. After selecting ONE answer for each item on the questionnaire, darken the corresponding spaces on the enclosed optical scan sheet using a number 2 pencil. After completing the survey and the scan sheet, put them in the enclosed envelope and hold them for Lt Smith to pick up. PLEASE DON'T COMPARE ANSWERS WITH YOUR COWORKERS!!

****

VERY IMPORTANT!!!!!! BEFORE ANSWERING THE QUESTIONS, PLEASE DO THE FOLLOWING STEPS:

1) LOCATE YOUR WORK CODE NUMBER THAT YOU CIRCLED FROM THE PREVIOUS PAGE.

2) PUT THIS NUMBER IN THE IDENTIFICATION NUMBER BLOCK ON THE ANSWER SHEET.

3) START AT THE FAR LEFT OF THE IDENTIFICATION BLOCK AND WRITE THE NUMBER IN. WHEN FINISHED, PLEASE DARKEN THE APPROPRIATE CIRCLE FOR EACH DIGIT OF THE WORK GROUP NUMBER.

CIRCLE THE ONE ANSWER TO EACH QUESTION THAT BEST DESCRIBES YOU.

1. How old are you?

[1] 18 to 20 [5] 26 to 30
[2] 21 to 22 [6] 31 to 35
[3] 23 to 24 [7] 36 to 40
[4] 24 to 25 [8] over 40

2. What is your sex?

[1] male
[2] female

3. What is your marital status?

[1] married
[2] never married
[3] divorced
[4] separate
[5] widowed

4. Which category applies to you?

[1] enlisted first term
[2] enlisted second term
[3] career enlisted
[4] officer
[5] civilian (WG OR WB)
[6] civilian (GS or GM)

5. If you are a civilian employee, how much military service have you had?

[1] does not apply, I am active duty military
[2] civilian with no military service
[3] civilian with some military service
[4] civilian who retired from the military

6. How long have you been in your present status as a CIVILIAN OR MILITARY MEMBER?

[1] under 1 year to 3 years
[2] over 3 years but under 8 years
[3] over 8 years but under 12 years
[4] over 12 years but under 16 years
[5] over 16 years

7. How long have you been a member of your CURRENT SQUADRON of assignment?

[1] less than 6 months
[2] 6 months but less than 1 year
[3] 1 year but less than 2 years
[4] 2 years but less than 3 years
[5] 3 years or more

8. How long have you been in your PRESENT JOB POSITION?

[1] less than 3 months
[2] 3 months but less than 6 months
[3] 6 months but less than 1 year
[4] 1 year but less than 2 years
[5] 2 years but less than 3 years
[6] 3 years or more

9. How many DIFFERENT JOB POSITIONS have you held since being assigned to your current squadron?

[1] 1
[2] 2
[3] 3
[4] 4 or more

FOR THE FOLLOWING QUESTIONS YOU ARE GOING TO BE ASKED ABOUT YOUR WORK GROUP. THINK OF YOUR WORK GROUP AS THE UNIT YOU IDENTIFIED AT THE BEGINNING OF THE QUESTIONNAIRE. CIRCLE THE NUMBER THAT BEST DESCRIBES YOUR RESPONSE.

THE RESPONSE CHOICES FOR QUESTIONS 10 to 70 ARE AS FOLLOWS:

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

10. I feel A RESPONSIBILITY towards my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

11. I feel I am STRONGLY COMMITTED to my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

12. I CAN'T WAIT until I get moved to another work group in this squadron.

[1]--------[2]--------[3]------[4]--------[5]------[6]

13. I feel I am REALLY PART of my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

14. Most work groups in the squadron GET ALONG BETTER than my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

15. Each day I LOOK FORWARD to being with the members of my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

16. There is a HIGH SPIRIT OF TEAMWORK among my co-workers.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

17. Members of my work group take a PERSONAL INTEREST in one another.

[1]--------[2]--------[3]------[4]--------[5]------[6]

18. If I had the chance to do the same kind of work for the same pay in another work group, I would STILL STAY HERE in this work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

19. I would describe the atmosphere in my work group as FRIENDLY AND RELAXED.

[1]--------[2]--------[3]------[4]--------[5]------[6]

20. I FEEL ACCEPTED by the members of my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

21. My co-workers DO NOT KNOW how to treat people.

[1]--------[2]--------[3]------[4]--------[5]------[6]

22. All in all, I LIKE the people in my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

23. I DEPEND DIRECTLY on my co-workers to get my job done.

[1]--------[2]--------[3]------[4]--------[5]------[6]

24. I depend on my co-workers FOR INFORMATION that I need to do my job.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree | Disagree | Slightly Disagree | Slightly Agree | Agree | Strongly Agree

[1]--------[2]--------[3]------[4]--------[5]------[6]

****

25. Most of my job activities ARE NOT affected by my co-workers.

[1]--------[2]--------[3]------[4]--------[5]------[6]

26. I DO NOT depend on other people in my work group for materials, tools, or supplies that I need to do my job.

[1]--------[2]--------[3]------[4]--------[5]------[6]

27. People in my work group NEED MY ASSISTANCE to get their work done.

[1]--------[2]--------[3]------[4]--------[5]------[6]

28. In my job I provide HELP OR ADVICE that my co-workers need to do their jobs.

[1]--------[2]--------[3]------[4]--------[5]------[6]

29. I am SATISFIED with the amount of respect I receive from my co-workers.

[1]--------[2]--------[3]------[4]--------[5]------[6]

30. I am SATISFIED with the chances I have in my work group to accomplish something worthwhile.

[1]--------[2]--------[3]------[4]--------[5]------[6]

31. I AM NOT VERY SATISFIED with the opportunities I have to develop my skills and abilities in my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

32. Members of my work group VARY WIDELY in their skills.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

33. The members of my work group are **REALLY DIFFERENT** in their attitudes towards work.

[1]--------[2]--------[3]------[4]--------[5]------[6]

34. My work group contains members with **REALLY DIFFERENT** backgrounds.

[1]--------[2]--------[3]------[4]--------[5]------[6]

35. The members of my work group are **GENERALLY INTERESTED** in the same types of things.

[1]--------[2]--------[3]------[4]--------[5]------[6]

36. People in my work group **ARE NOT** afraid to speak their minds about problems and issues that affect them.

[1]--------[2]--------[3]------[4]--------[5]------[6]

37. My job requires that I **WORK CONSTANTLY** with others in my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

38. My work group is **USUALLY AWARE** of important events and situations.

[1]--------[2]--------[3]------[4]--------[5]------[6]

39. The people I work with **MAKE MY JOB EASIER** by sharing their ideas and opinions with me.

[1]--------[2]--------[3]------[4]--------[5]------[6]

40. My work group **KNOWS** what is needed to get the job done.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

41. Each member of my work group has a CLEAR IDEA of the group's goals.

[1]--------[2]--------[3]------[4]--------[5]------[6]

42. I AM AWARE of my squadron goals for my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

43. The goals set for my work group were determined WITHOUT my input.

[1]--------[2]--------[3]------[4]--------[5]------[6]

44. My co-workers ALL had a chance to discuss the goals set for our work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

45. I took an ACTIVE PART in helping to decide the goals of my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

46. I am FREQUENTLY MADE AWARE of the results of inspections concerning my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

47. I AM SELDOM TOLD whether or not my work is satisfactory.

[1]--------[2]--------[3]------[4]--------[5]------[6]

48. I REGULARLY socialize with other members of my work group during off duty hours.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

49. I OFTEN PARTICIPATE OR GO AND SUPPORT my work group in squadron athletics.

[1]--------[2]--------[3]------[4]--------[5]------[6]

50. I attend squadron social functions PRIMARILY because my boss expects me to.

[1]--------[2]--------[3]------[4]--------[5]------[6]

51. Most of my friends ARE NOT people I work with.

[1]--------[2]--------[3]------[4]--------[5]------[6]

52. If I had it my way, I WOULD NEVER socialize with anyone in my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

53. People in my work group are given PROPER RESPONSIBILITY according to rank and ability.

[1]--------[2]--------[3]------[4]--------[5]------[6]

54. Evaluation systems (APR'S,OER'S,JPAS'S) are GIVEN FAIRLY in my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

55. My immediate supervisor TREATS EVERYONE the same in my work group.

[1]--------[2]--------[3]------[4]--------[5]------[6]

56. My immediate supervisor likes to make ALL the decisions concerning my job.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

57. My supervisor **DOES NOT USUALLY** ask for my opinions and thoughts on decisions affecting my work.

[1]--------[2]--------[3]------[4]--------[5]------[6]

58. I am **USUALLY** allowed to participate in decisions affecting my job.

[1]--------[2]--------[3]------[4]--------[5]------[6]

59. My immediate supervisor demands that subordinates do **HIGH QUALITY** work.

[1]--------[2]--------[3]------[4]--------[5]------[6]

60. My immediate supervisor **MAKES SURE** subordinates have clear goals to achieve.

[1]--------[2]--------[3]------[4]--------[5]------[6]

61. My immediate supervisor tends to ***PLAY FAVORITES.***

[1]--------[2]--------[3]------[4]--------[5]------[6]

62. My immediate supervisor **IS NOT** technically qualified for his or her position.

[1]--------[2]--------[3]------[4]--------[5]------[6]

63. The **QUANTITY** of output in my work group is very high.

[1]--------[2]--------[3]------[4]--------[5]------[6]

64. The **QUALITY** of output in my work group is very high.

[1]--------[2]--------[3]------[4]--------[5]------[6]

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
[1]	[2]	[3]	[4]	[5]	[6]

****

65. When high priority work arises, such as short suspenses and schedule changes, the people in my work group do an OUTSTANDING job in handling these situations.

[1]--------[2]--------[3]------[4]--------[5]------[6]

66. My work group always gives its MAXIMUM effort.

[1]--------[2]--------[3]------[4]--------[5]------[6]

67. My work group's performance in comparison to other groups IS NOT very high.

[1]--------[2]--------[3]------[4]--------[5]------[6]

68. My individual work performance is VERY HIGH.

[1]--------[2]--------[3]------[4]--------[5]------[6]

69. My work group HELPS ME to be a more productive person.

[1]--------[2]--------[3]------[4]--------[5]------[6]

70. I perform very well WITH OR WITHOUT my co-workers assistance.

[1]--------[2]--------[3]------[4]--------[5]------[6]

THANKS FOR TAKING THE TIME TO FILL OUT THIS SURVEY. REMEMBER, ONCE YOU'VE COMPLETED THE SURVEY GO BACK AND MAKE SURE YOU HAVE DARKENED THE CORRESPONDING SPACES ON THE ENCLOSED OPTICAL SCAN SHEET. PUT THE SURVEY AND THE SCAN SHEET IN THE ENCLOSED ENVELOPE AND HOLD THEM FOR LT SMITH TO PICK UP.

Appendix D: Supervisor's Rating Form

INSTRUCTIONS: Use the rating scales given below to indicate the "typical" job effectiveness of the employee identified above. Please complete all the items on this form. Note that each rating scale refers to a different aspect of work performance so there may be some amount of variation between the performance dimensions shown for a single individual. Circle the number beside each performance dimension that best describes this worker's performance compared to the performance of other employees doing similar work.

	Far Worse	Much Worse	Slightly Worse	About Average	Slightly Better	Much Better	Far Better
1. Quantity of Output	1	2	3	4	5	6	7
Def: The productivity of an employee in terms of units of work produced or services rendered.							
2. Quality of Work	1	2	3	4	5	6	7
Def: The degree to which work products are free from error and/or conform to standards and specifications.							
3. Efficiency of Work	1	2	3	4	5	6	7
Def: The degree to which resources (e.g., money, materials, personnel) are used to their maximum capacity and waste is kept to a minimum.							
4. Problem-Solving Capacity	1	2	3	4	5	6	7
Def: Represents the ability of an employee to anticipate problems that may come up and either prevent them or minimize their effects upon the operations of the work unit.							
5. Adaptability/Flexibility	1	2	3	4	5	6	7
Def: Represents the ability of an employee to adjust to special circumstances (e.g., "crash projects" and sudden schedule changes) and perform under less than optimal conditions.							
6. Overall effectiveness	1	2	3	4	5	6	7

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Vita

Captain Brian S. Smith was born on 29 November 1960 in Batavia, New York. He graduated from high school in Caledonia, New York in 1978. Captain Smith attended Grove City College in Grove City, Pennsylvania from 1978 to 1982. In 1982 Captain Smith received a Bachelor of Arts in Business Management from Grove City College and a commission in the United States Air Force (USAF) through the Reserved Officer Training Corps (ROTC). Captain Smith was then assigned to Williams AFB, Arizona where he served as the customer support officer and materiel management officer in base supply from 1982 to 1984. During this period Captain Smith received a Masters in Business Administration from Golden Gate University. Captain Smith was distinguished during his tour at Williams AFB as the 1984 Support Junior Officer of the Year and the 1984 Outstanding Junior Supply Officer in the Air Training Command. He entered the School of Systems and Logistics, Air Force Institute of Technology, in May 1985.

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This research investigated the relationship of cohesion and productivity among work groups. The study was accomplished in two phases. First, the study investigated the strength of the relationship between cohesion and several variables that the literature reviewed as being strongly related with group cohesion. The strength of association that these variables had with cohesion was tested using a sample of employees from a military supply squadron. Secondly, the research studied the relationship between group cohesion and work group performance through employee and supervisory perceptions of group productivity and through the collection of actual productivity measures.

The variables that were significantly related to group cohesion were independence, communication, supervisor influence, participation in goal setting, rewards, and employee perceptions of group performance at the $p < .001$ level. The development of a cohesion scale resulted in observed significant differences between low and high cohesive groups in supervisor influence, participation in goal setting, and employee perceptions of group productivity. The supervisors' evaluation of group productivity did not support the hypothesis that group cohesion is positively related to group productivity. The actual productivity measures showed a weak association with group cohesion, but the lack of statistical evidence of this relationship precluded any support for the notion that group cohesion is related to group productivity. Several implications of the research to military and civilian managers were explained and recommendations were made for further investigation of cohesion/productivity relationships.

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